APPENDIX B

The Tier III Coalition for Wireless E911
Petition Pursuant to 47 U.S.C. §160(c)
for Forbearance from E911 Accuracy
Standards Imposed on Tier III Carriers for Locating
Wireless Subscribers Under Rule Section 20.18(h)
filed November 20, 2002
"Forbearance Petition"

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Petition Pursuant to 47 U.S.C. §160(c)	)	WT Docket No. _____
For Forbearance From E911	)	
Accuracy Standards in Section 20.18(h)	)	
of the Commission's Rules	)	

PETITION PURSUANT TO 47 U.S.C. §160(c) FOR FORBEARANCE FROM E911 ACCURACY STANDARDS IMPOSED ON TIER III CARRIERS FOR LOCATING WIRELESS SUBSCRIBERS UNDER RULE SECTION 20.18(h)

Respectfully submitted,

THE TIER III COALITION FOR WIRELESS E911

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SUMMARY

The Tier III Coalition for Wireless E911 hereby petitions the Commission to forbear from enforcing the quantitative accuracy standards set forth in Section 20.18(h)(1) and (2) of the Rules with respect to Tier III carriers operating in their Commission-licensed service areas. Forbearance is requested for a limited period, up to and including December 31, 2005. Assuming forbearance is granted, Tier III carriers will still be obligated to comply with the bulk of their E911 obligations, such as selecting, ordering, installing and optimizing Phase II technical solutions within six months of a PSAP request or by September 1, 2003, whichever occurs later.

No commercially available Phase II-compliant E911 location system (network or handset based), in existence today, has been identified that can be economically deployed and satisfy Section 20.18(h) accuracy standards throughout a licensed rural service area. Moreover, there is no record support for imposing the same quantitative accuracy standards derived for a dense urban area on a sparsely-populated Tier III rural area where a 911 caller can be physically located more quickly notwithstanding a more flexible accuracy requirement. Accordingly, this petition asks that the Commission forbear from enforcing Section 20.18(h) accuracy standards in rural areas served by Tier III carriers.

If forbearance is granted, Tier III carriers can deploy network-based Phase II solutions within their FCC-authorized coverage areas from presently existing transmitting facilities, utilizing existing cell site antenna configurations. Alternatively, for Tier III carriers utilizing a digital technology for which ALI-capable handsets are available and who deploy handset-based solutions, no further enhancements to that handset-based solution will be required in order to increase the resulting accuracy levels. For either

deployment, the Commission will deem the resulting accuracy levels compliant, even if they fall outside the parameters set forth in Section 20.18(h).

During the forbearance period, interested parties (carriers, equipment vendors, PSAPs, the Commission and other experts) will work to overcome the multiple issues that continue to vex Phase II solutions in the smallest, rural markets served by Tier III carriers. As these matters are resolved, E911 accuracy and reliability in Tier III markets can be expected to improve. At the same time, these interested parties will be able to ascertain the locational accuracy levels that can be economically attained for both network and handset-based technologies in "real world" deployments in rural applications. Finally, "real world" information can be gathered to enable the Commission to actually determine the accuracy levels that are truly required to meet the public safety need in these demographically-distinctive areas.

Approximately one year ago, the Commission appointed Mr. Dale Hatfield, a former FCC official, to investigate the multiple implementation issues attending provisioning of wireless E911 service. Mr. Hatfield's Report, which was filed with the Commission in October 2002, confirms that technological, operational and other factors involved in implementing Phase II E911 solutions will impede compliance with Section 20.18(h) requirements, particularly in Tier III service areas. In the next to last paragraph of his report, Mr. Hatfield agrees "with the notion that additional flexibility— rather than rigid rules— may, in some cases at least, actually facilitate the roll out of wireless E911 services."

As the foregoing demonstrates, the instant forbearance petition is specific, focused and limited in scope, and shows a path to full compliance, although those benchmark requirements were imposed by the Commission on parties seeking waiver relief from E911 Phase II requirements under Section 1.925 of the Commission's Rules. The legal hurdle for obtaining forbearance relief under Section 10 of the

Communications Act is considerably lower than that imposed on waiver petitioners under Section 1.925 of the Commission's Rules. Regarding the criteria set forth in Section 10 of the Communications Act, petitioners show that strict application of Section 20.18(h) to Tier III carriers is unnecessary to ensure that their charges, practices, classifications, *etc*. are just, reasonable and non-discriminatory. Nor is strict enforcement of Section 20.18(h) necessary to protect consumers; moreover, forbearing from that enforcement will encourage competition in the relevant service markets. The limited forbearance from Section 20.18(h) enforcement requested here is, therefore, decidedly in the public interest and should be granted.

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FEDERAL COMMUNICATIONS COMMISSION
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PETITION PURSUANT TO 47 U.S.C. §160(c)
FOR FORBEARANCE FROM E911 ACCURACY
STANDARDS IMPOSED ON TIER III CARRIERS FOR LOCATING
WIRELESS SUBSCRIBERS UNDER RULE SECTION 20.18(h)

The Tier III Coalition for Wireless E911 ("TierIIICo") hereby petitions the Federal Communications Commission ("Commission" or "FCC") to forbear from enforcing the accuracy and reliability standards set forth in Section 20.18(h) of the Commission's Rules with respect to Commercial Mobile Radio Service ("CMRS") provided by Tier III wireless carriers in their respective service areas.[1/] Significantly, TierIIICo seeks relief only from the strict quantitative requirements imposed by Section 20.18(h)(1) and (2) on Tier III carriers providing service in their licensed service areas[2/] and does ***not*** seek to delay the deployment of location identifying E911 Phase II technologies as those deployment requirements are triggered by local Public Service Answering Point ("PSAP"s). Moreover, TierIIICo seeks forbearance only for a limited period, up to and

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[1/] This petition is filed in accordance with Section 10 of the Communications Act, as amended by the Telecommunications Act of 1996 ("Telecom Act" or the "Act"), 47 U.S.C. § 160, and Section 1.53 of the Commission's Rules. TierIIICo is a group of Tier III carriers who seek relief from the accuracy standards in Section 20.18(h) of the Rules. TierIIICo's constituent carriers are listed in Appendix A hereto.

[2/] To the extent the grounds for forbearance presented here also apply to Tier I and Tier II carriers with respect to their rural operations, the relief sought herein could equally apply to such large carriers with respect to their rural deployments.

including December 31, 2005, to allow sufficient time for the collection of meaningful accuracy and reliability information to enable all parties to learn, with certainty, the economically attainable level of location accuracy for both network and handset-based technologies in the real world deployment in rural environments. Again, TierIIICo seeks no relief with respect to the other obligations imposed by Section 20.18.

If this petition is granted, Tier III carriers will continue their efforts to implement Phase II E911 service and comply with the deadlines set forth in Section 20.18(f) and (g), as recently modified by the Commission.[3/] Forbearance from application of Section 20.18(h) means only that Tier III carriers will be insulated from enforcement action if, at least initially, they are unable to achieve the precise accuracy levels now dictated by Section 20.18(h). [4/] As shown below, the limited regulatory forbearance proposed here satisfies all relevant statutory and agency standards and should be granted.

I. BACKGROUND

In its very first sentence, the Communications Act states that the Commission's regulatory objective is, *inter alia*, to make available a rapid, efficient nationwide and global wire and radio

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[3/] Revision Of The Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 (Order To Stay), 17 FCC Rcd 14841 (2002), (hereinafter "*Phase II Stay Order*"); *see* "Wireless Telecommunications Bureau Seeks Comment On Petitions For Reconsideration Regarding Order To Stay E911 Phase II Rules For Small Carriers," Public Notice in CC Docket No. 94-102, DA 02-2285, released September 16, 2002.

[4/] Section 20.18(h) presently requires all carriers to provide to the designated Public Safety Answering Point ("PSAP") the location of all 911 calls subject to the following quantitative standards for location accuracy and reliability: for carriers deploying network-based technologies, 100 meters for 67 per cent of calls and 300 meters for 95 per cent of calls; for carriers deploying handset-based technologies, 50 meters for 67 per cent of calls and 150 meters for 95 per cent of calls.

communication service "for the purpose of promoting safety of life and property."[5/] Consistent with that unambiguous statutory purpose, the Commission initiated a rulemaking in October 1994 designed to achieve major improvements in the quality and reliability of 911 and enhanced 911 services available to customers of cellular, broadband personal communications systems ("PCS") and certain Specialized Mobile Radio licensees. The subject docket— Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102— has been open and active throughout the past eight years during which time the Commission sought to realize improved wireless E911 capability and thereby promote safety of life and property in this nation.

The Commission's first order in the Enhanced 911 Emergency Calling Systems docket adopted initial wireless E911 rules that established implementation schedules for both Phase I and Phase II E911, and required PSAPs to expressly request that wireless carriers implement Phase I and Phase II to induce the latter's deployment obligations.[6/] Under the initial rule, wireless carriers were obligated to provide requesting PSAPs with the longitude and latitude of all 911 calls within a radius of 125 meters (using root mean square techniques) beginning October 1, 2001.[7/] Significantly, the

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[5/] 47 U.S.C. § 151.

[6/] Revision Of The Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 (Report and Order and Further Notice of Proposed Rulemaking), 11 FCC Rcd 18676 (1996) (hereinafter "*First R&O*")

[7/] *Id*. On reconsideration, the Commission amended the rule to clarify that licensees subject to the requirement had to provide the PSAP the longitude and latitude of all 911 calls at an accuracy level of 125 meters or less using root mean square technology. As a result, there would be roughly a 67 to 75 per cent probability that the reported location would be within 125 meters of the 911 caller's actual location. Revision Of The Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 (Memorandum Opinion and (continued...)

Commission acknowledged that the costs associated with deployment of these location technologies, especially in a rural environment, would be prohibitive.[8/] Accordingly, the Commission expressly conditioned the obligation of rural deployment on prior establishment of a meaningful cost-recovery mechanism. When cost-recovery mechanisms failed to develop commensurately with the perceived need for the service, the Commission dropped the prior cost-recovery mechanism condition, opting instead for a "cost recovery by any allowable means" standard. Unfortunately, for rural carriers with limited subscriber bases, no meaningful method to recover the high cost of system deployment exists.

When initial wireless E911 rules were adopted, there was a general consensus that wireless carriers would use network-based technologies to provide Phase II E911. Technological advances indicating potential availability of handset-based Phase II solutions, however, caused the Commission in 1999 to revise its wireless E911 rules to reflect that development, and to establish separate accuracy and implementation schedules for handset-based and network-based technologies.[9/] Thus, in the *Third R&O*, the Commission acknowledged (¶ 33) that there was no perfect automatic

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[7/](...continued)
Order), 12 FCC Rcd 22665, 22726 (1997) (hereinafter "*First MO&O*").

[8/] "No party disputes the fundamental notion that carriers must be able to recover their costs of providing E911 services." *Id.* at ¶ 89.

[9/] Revision Of The Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 (Third Report and Order), 14 FCC Rcd 17388 (1999) (hereinafter "*Third R&O*"). At about the time the *Third R&O* became public, Congress ratified the Commission's efforts to accelerate E911 availability by enacting the Wireless Communications and Public Safety Act of 1999 (Pub. L. No. 106-81, enacted Oct. 26, 1999). This law was designed to enhance public safety by facilitating prompt deployment of a seamless communications infrastructure, including wireless technology, for nationwide emergency services.

location identification ("ALI") solution and, in that context, "the public interest and public safety will best be served by allowing a broad range of technologies, including handset-based opportunities, a reasonable opportunity to compete in providing 911 ALI." For that reason, the Commission revised the handset implementation schedule by requiring handset-based Phase II carriers, without regard to any PSAP request for Phase II capability, to begin selling ALI-capable handsets (whether new, modified or upgraded) no later than March 1, 2001, and to ensure that at least 50 per cent of all handsets activated were ALI-capable by October 1, 2001 and at least 95 per cent of activations were ALI-capable by October 1, 2002.[10/] Upon receipt of a PSAP request, the carrier, either within six months of the request or by October 1, 2001, whichever was later, was to insure that 100 per cent of all new handsets activated were ALI-capable. Within two years of such a request or by December 31, 2004, whichever was later, wireless carriers deploying handset technology had to "undertake reasonable efforts to achieve 100 percent penetration of ALI-capable handsets" in their overall subscriber base.

Regarding network-based Phase II solutions, the *Third R&O* (¶ 72) replaced the root mean square reliability methodology with a "dual ring" standard requiring accuracy within 100 meters of the calling party's actual location for 67 per cent of calls, and 300 meters for 95 per cent of calls. [11/]

[10/] In contrast to the deadlines imposed on carriers relying on a handset-based solution, the phase-in of network-based location technology mandated by the *Third R&O* depended on a PSAP request, unless that request was received before April 1, 2001. Carriers deploying network-based infrastructure were required to provide Phase II 911 enhanced service to at least 50 per cent of their coverage area or 50 per cent of the their population beginning October 1, 2001 or within six months of a PSAP request, whichever occurred later. That obligation expanded to 100 per cent (of coverage area or population) within eighteen months of such a request or October 1, 2002, whichever occurred later. *Third R&O*, Appendix B, Final Rules: Section 20.18(f).

[11/] The corresponding handset based accuracy standard was fixed at 50 meters/67 (continued...)

The Commission devised and promulgated the outer ring, 300 meter standard because:

> network-based solutions may not always be able to provide the higher level of accuracy, *especially in rural areas*. The 300 meter level of accuracy should nonetheless provide a *very useful* indication of location, particularly in those rural areas.[12/]

Approximately two years ago, responding to petitions seeking reconsideration of the *Third R&O* because the handset-based deployment schedule therein was too aggressive, the Commission again revamped the relevant milestones for implementing handset-based technology.[13/] Specifically, the phase-in requirements precipitated by a PSAP request were eliminated, and the general deadlines were relaxed. Carriers relying on handset technology were required to begin selling ALI-capable handsets by October 1, 2001. By December 31, 2001, at least 25 per cent of all newly-activated handsets were to be ALI capable; by June 30, 2002, 50 per cent; and by December 31, 2002, 100 per cent.[14/] Rather than require handset-deploying wireless carriers to implement "reasonable efforts to achieve 100 percent penetration of ALI-capable handsets" in their subscriber base by December 31, 2004, the *Fourth MO&O* extended the deadline to December 31, 2005 and, to reduce uncertainty,

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[11/](...continued)
percent and 150 meters/95 per cent *Id. (*¶ 74.) The Commission purposely imposed a more stringent accuracy standard for handset-based technology: (a) to account for increasing locational accuracy realized in its testing; and (b) to offset the delay attending the need to phase-in handset solutions over time, as new or upgraded handsets replace the embedded base of non-capable E911 handsets. *Id*. (¶¶ 73-74).

[12/] *Id*. (¶ 72) (emphasis added).

[13/] *Revision of the Commission's Rules to Ensure Compatibility With Enhanced 911 Emergency Calling Systems,* CC Docket No. 94-102 (Fourth Memorandum Opinion and Order), 15 FCC Rcd 17442 (2000), (hereinafter *"Fourth MO&O"*).

[14/] *Id*., ¶¶ 33-37.

substituted a mandatory 95 per cent penetration level for the "reasonable efforts" to achieve 100 per cent penetration found in the *Third R&O*.

Certain parties to the *Third R&O* reconsideration proceeding advocated uniform Phase II accuracy standards, irrespective of technology deployed, because disparate standards for network- versus handset-based technology "serve no logical public safety purpose and destroy competitive neutrality."[15/] Concluding that E911's contribution to overall public safety entails more than considerations of accuracy alone, the Commission rejected the proposal:

> Accuracy is *only one* of several means by which location technologies contribute to public safety. The rate and extent of deployment, reliability, encouragement of further improvements, and cost are other relevant factors. Moreover, a rule that is ostensibly neutral on its face may in fact favor one technology and preclude another, however valuable to public safety.[16/]

The Commission then stressed that its paramount objective in imposing E911 regulations is public safety. To realize that objective, fair and open competition among rival E911 technologies is encouraged. Although accuracy is one element in judging this competition, there are others, all of which are relevant to improving public safety.[17/]

As indicated above, the first E911 accuracy, reliability, deployment and coverage rules were promulgated in 1996. From that time until issuance of the *Fourth R&O* in September 2000, these regulations have been revised, amended and revamped on numerous occasions. Only several months

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[15/] *Id*., ¶ 39.

[16/] *Id*., ¶ 40 (emphasis added).

[17/] *Id.* ¶ 85.

ago, in the *Phase II Stay Order*, [18/] the Commission found it necessary again to defer its recently established compliance deadlines for both handset- and network-based Phase II technologies. This deferral applied only to non-nationwide CMRS carriers, which were further classified into two groups, Tier II and Tier III, based on size. Regarding Tier III carriers, the subject of this petition, the *Phase II Stay Order* extended the interim handset and network upgrade compliance deadlines by thirteen months.

Even with the latest delay, rural carriers continue to face significant costs to deploy Phase II E911 systems whose technologies remain unproven, in rural applications, in their ability to meet a defined accuracy standard that may ultimately prove both unattainable and unnecessary in meeting the public safety goals of the E911 rules. If rural carriers were to expend significant limited resources toward achieving E911 Phase II compliance, fail nevertheless to meet the Commission's accuracy standards, and ultimately still need to seek universal waiver relief from the agency, the waste of limited resources in a failed effort and its impact on the small rural carrier would be profound. Indeed, absent the type of relief sought here, carriers are at a total loss to know how much money must be spent on the failing proposition to try and meet an unattainable accuracy standard before sufficient justification can be made to obtain a waiver. The potential waste of scarce carrier resources would be only further amplified if, after having spent significantly more money in a failed effort to meet accuracy requirements which still prove unachievable, it is ultimately concluded, from "real world" rural experience for reasons discussed below (and as TierIIICo expects), that an accuracy standard far less rigorous than the standard codified in Section 20.18(h) of the Rules,

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[18/] Revision Of The Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 (Order To Stay), 2002 FCC LEXIS 3638, FCC 02-210 (2002) ("*Phase II Stay Order*").

enabled more rapid location of a wireless 911 caller in a rural environment than resulted from the strict application of the defined standard in an urban setting.

Therein lies the heart of the problem. E911 solutions, both handset and network-based, remain untested in true rural applications. Equally undocumented is the actual need for the same stringent urban standard in an open, rural environment. TierIIICo submits that locating a stranded subscriber to within 1000 feet in an open rural setting may prove every bit as effective in actually locating the subscriber, for far less cost. When coupled with the fact that it may never be economically possible to achieve a higher, but unneeded level of accuracy, the basis for the limited forbearance sought herein becomes readily apparent.

II. THE FORBEARANCE STANDARD

The Communications Act requires forbearance from the quantitative accuracy requirements imposed by Section 20.18(h)(1) and (2) of the Commission's Rules where Section 10 of the Act's standards are satisfied. Section 10, 47 U.S.C. § 160, directs the FCC to forbear from applying any regulation or any statutory provision to a telecommunications carrier or a telecommunications service (or class of carriers or services) if the Commission finds that:

1. enforcement of such regulation or provision is not necessary to ensure that the charges, practices, classifications, or regulations by, for, or in connection with that carrier or service are just and reasonable, and are not unjustly or unreasonably discriminatory;

2. enforcement of such regulation or provision is not necessary for the protection of consumers; and

3. forbearance from applying such regulation or provision is consistent with the public interest; in making this determination, the Commission must consider whether forbearing from enforcing the regulation will promote competitive market conditions,

including the extent to which such forbearance will enhance competition among service providers.[19/]

Although prior forbearance petition decisions by the Commission may have avoided or obscured the issue, Section 10(a) requires the Commission to justify continued enforcement of a regulation from which relief is sought.[20/] Absent express Commission action denying a forbearance petition, Section 10(c) compels its grant. As a result, *grant* of a forbearance petition is the default outcome; if it wishes to deny the petition and enforce the regulation, the Commission must demonstrate that the specific requirements stated in 10(a)(1), (a)(2) or (a)(3) have not been met. Absent such a showing by the Commission, the forbearance petition must be granted. [21/]

As the foregoing analysis signifies, the legal requirements imposed by Congress under Section 10 of the Communications Act on forbearance petitions differ materially from those imposed by the Commission under Section 1.925 of its Rules on waiver requests. The latter require the waiver proponent to demonstrate either: (a) that the rule's underlying purpose would be frustrated or dis-served by its instant application and that the waiver serves the public interest; or (b) that the rule's application, due to unique or unusual circumstances, would be inequitable, unduly burdensome or contrary to the public interest, or that the party seeking the waiver has no reasonable alternative.

Thus, the waiver proponent has the burden of satisfying relatively broad and arguably discretionary standards— that enforcing the rule will frustrate or dis-serve its underlying purpose,

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[19/] *See* 47 U.S.C. §160(b).

[20/] Verizon Wireless's Petition for Partial Forbearance from the Commercial Mobile Radio Services Number Portability Obligation and Telephone Number Portability, 27 CR 331, 346-348 (2002); separate statement of Commissioner Martin, approving in part and dissenting in part.

[21/] *Id*.

or that unusual factual circumstances make the rule's application inequitable or unduly burdensome. By contrast, the Section 10 petitioner need show only that the subject rule is "not necessary" to ensure that a carrier's charges, practices and classifications are just, reasonable and non-discriminatory, nor is it necessary to protect consumers, and that forbearance is generally pro-competitive. Moreover, denying the proposed waiver is the default outcome under 1.925, the polar opposite of the result under Section 10. A waiver denial will be upheld on judicial review unless a rejected petitioner can demonstrate that the Commission's reasons for denying the request are "so insubstantial as to render the denial an abuse of discretion," an admittedly "heavy" burden.[22/]

The legal hurdle faced by the forbearance petitioner under Section 10 is, therefore, considerably lower than that faced by the waiver petitioner under Section 1.925. This distinction is significant here because the *Phase II Stay Order* (at ¶ 41) held that it was premature, with one exception, to grant any additional relief from accuracy requirements and denied "all petitions for waiver of the accuracy standard" (emphasis added). The instant request seeks relief under the more flexible and less exacting forbearance standard and must be considered in that context.[23/]

In the past, the Commission has denied forbearance petitions upon determining that one or more prongs of Section 10's tripartite test were not satisfied. Regarding the instant request to forbear from Section 20.18(h)'s accuracy and reliability standards in Tier III service areas, for a limited and

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[22/] Green Country Mobilephone, Inc. v. FCC, 765 F. 2d 235, 238 (D.C. Cir. 1985), quoting Thomas Radio Co v. FCC, 716 F.2d 921, 924 (D.C. Cir. 1983).

[23/] Although the operative standards for forbearance and waiver petitions are indisputably distinct, the instant petition heeds the Commission's advice that future waiver requests from, *inter alia*, rural carriers are "specific, focused and limited in scope, and [show] a clear path to full compliance." *Fourth MO&O*, 15 FCC Rcd 17442). In this respect, the instant petition exceeds Section 10 requirements for a forbearance petition.

specific period of time in order to enable the Commission to realistically determine both the achievability and need for the higher standards in the rural environment, all relevant aspects of Section 10 are readily fulfilled.

Finally, TierIIICo submits that forbearance for a limited period of time is far preferable, from a regulatory standpoint, than forcing the Commission to consider what must amount to nothing short of a blanket waiver of the accuracy requirements in the event that they are unachievable in the rural "real world." Accordingly, the relief sought here is in the public interest and should be granted by the Commission. Since the Commission has determined that waiver requests are premature, rural carriers, with limited access to financial resources, are faced with the paradox of having to spend funds toward a goal that may not be achievable, only to be faced with ultimately still requiring the waiver, after wasting many times the amount of resources needed to provide a level of accuracy that satisfies emergency needs in the rural "real world."

TierIIICo has been unable to find a network based solution vendor that will guaranty the ability to meet the FCC accuracy requirements without the need to deploy significantly more cell sites for location-only purposes, many of which will need to be placed outside of the rural carrier's licensed service area, in combination with more costly antenna systems at existing sites. Similarly, handset-based solutions, which require visual sighting to GPS satellites, and absent that sighting, assistance from the network, also provide no guaranty of compliance. The current position of facing possible enforcement actions regardless of the technical ability to achieve the requisite accuracy requirements, creates a regulatory environment where rural carriers are facing virtually unlimited financial exposure by not knowing how far they have to go in their efforts to comply with a level of accuracy that, by all indications, cannot be economically achieved with today's technology in the

rural application. This risk is having an adverse impact on the continued availability of funding for ongoing network upgrades and expansions for non-E911 needs and threatens the continued competitive existence of the rural carriers.

III. MULTIPLE TECHNICAL, OPERATIONAL AND PRACTICAL CONCERNS PRECLUDE TIER III CARRIERS FROM STRICTLY COMPLYING WITH SECTION 20.18(h) ACCURACY REQUIREMENTS

Subjecting Tier III carriers to strict enforcement of the accuracy and reliability standards codified in Section 20.18(h) of the Commission's Rules is unlikely to promote public safety and may indeed be inimical to it. As already shown, in initiating the Enhanced 911 Emergency Calling Systems docket, the Commission was attempting to fulfill the Communication Act's directive to make available a nationwide communications service "for the purpose of promoting safety of life and property."[24/] TierIIICo respectfully submits that rigid enforcement of Section 20.18(h)'s exacting standards against Tier III carriers in the short-term will be inconsistent with the Commission's policy objective of enhancing public safety — a particularly adverse outcome in the post-September 11 environment where safety and security have become paramount national concerns.

The Commission has stated that accuracy is only one criteria by which to measure wireless E911's contribution to public safety. Other important considerations include reliability, cost and extent of deployment. If strict adherence to Section 20.18(h)'s accuracy standards were to reduce reliability and extent of deployment, while substantially inflating costs, the ramifications for public safety would be profoundly negative. Enforcing Section 20.18(h) against Tier III carriers is,

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[24/] 47 U.S.C. § 151.

however, likely to have this perverse outcome because of the considerable technical, operational, practical and strategic concerns that implementing Phase II technology, both network and handset-based, in the physical environment served by Tier III carriers presents.

The Commission has long been aware of the multiple implementation issues attending the provisioning of wireless E911 service. Almost one year ago, a former Chief of the Office of Engineering and Technology, Mr. Dale Hatfield, was commissioned to conduct an inquiry assessing these issues and their effect on wireless E911 deployment.[25/] That inquiry culminated in a report (the "*Hatfield Report*"), which was filed with the Commission on October 15, 2002 and which corroborates that technological, operational and other factors involved in implementing Phase II E911 technology will impede compliance with Section 20.18(h) requirements, particularly in Tier III service areas.[26/] In the *Hatfield Report*'s penultimate paragraph, the informed and unbiased expert designated by the Commission notes his agreement "with the notion that additional flexibility— rather than rigid rules— may, in some cases at least, actually facilitate the roll out of wireless E911 services."[27/]

A. NETWORK-BASED PHASE II TECHNOLOGY

The difficulty of achieving Section 20.18(h) accuracy and reliability in rural settings is well-documented in the Enhanced 911 Emergency Calling Systems docket and by the *Hatfield Report*.

[25/] "FCC Announces Dale Hatfield to Lead Inquiry of Technical and Operational Issues Affecting Deployment of Wireless Enhanced 911 Services," News Release, rel. Nov. 20, 2001.

[26/] "Wireless Telecommunications Bureau Seeks Comment On Report On Technical And Operational Wireless E911 Issues, WT Docket No. 02-46, " Public Notice, DA 02-2666, rel. Oct. 16, 2002, announcing filing of "Report on Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911 Services," by Dale N. Hatfield (hereinafter "*Hatfield Report*").

[27/] *Hatfield Report*, p. 45.

Rural wireless systems confront coverage and other technical challenges that are substantially different from their counterparts that serve urban, suburban and even ex-urban locales. The unique configuration of rural systems, coupled with terrain characteristics and other environmental features of these areas, substantially complicates the triangulation process on which network-based technology depends.

To maximize coverage in vast rural areas, Tier III carriers attempt to deploy wide-spaced omnidirectional cells with minimal overlap among reliable service contours; although the degree of overlap suffices to provide quality CMRS service, it is inadequate for triangulating a mobile position throughout the coverage area as network-based technology requires. Rural networks are frequently designed to cover a highway traversing an unpopulated or sparsely populated area; as a result, base stations are located "in a ribbon or 'string of pearls' configuration that makes triangulation difficult."[28/] Triangulation is further impeded where the mobile initiating a "911" call is at the perimeter of a Tier III service area, or where hills or other terrain features preclude signal reception from more than one base station.[29/]

Theoretically, some of these issues might be solved by adding base stations and other network elements. Because this infrastructure will generate minimal if any incremental revenue (*see infra* Section IV.B.1), the associated capital and operating costs will have to be recouped entirely from existing local subscribers. The comparatively low subscriber levels associated with Tier III systems implies that recovering these costs will impose a crushing burden on a small number of users. Moreover, implementing network-based Phase II solutions in even the most hospitable

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[28/] *Hatfield Report*, p. 12.

[29/] *Third R&O*, ¶ 23.

geographic setting requires installing additional equipment at each existing base station, a substantial investment that must also be recovered.[30/]

Cost is as important as accuracy in evaluating the contributions that wireless E911, in general, and Phase II E911, in particular, make to public safety. A Tier III carrier seeking to recover the costs of achieving Section 20.18(h) accuracy in truly rural systems in any reasonable time frame could reasonably saddle consumers with intolerable financial burdens, forcing them to discontinue service or substitute a less expensive form of service, which lacks E911 capability (*e.g.*, paging or non-interconnected dispatch). To minimize this prospect, Tier III carriers could reduce the rate and extent of deployment, or utilize unreliable or unproven vendors, *etc*., alternatives which themselves would still require waivers of the Commission's Phase II Rules. These outcomes, the product of rigidly applying an exacting accuracy standard in rural environs, will diminish rather than enhance the safety of life and property— the antithesis of the Commission's policy objective in the Enhanced 911 Emergency Calling Systems docket. In sharp contrast, the limited forbearance sought herein will hasten deployment of an E911 Phase II solution which, while possibly below the Section 20.18(h) standard throughout the rural market, will most likely provide an acceptable level of accuracy in the more open, rural areas served by Tier III carriers.

Even if these formidable problems were to instantly disappear, Tier III carriers face practical obstacles to Section 20.18(h) compliance that by themselves justify forbearance from enforcing that rule provision. As the Commission acknowledged, network-based location technology vendors afford priority to Tier I (nationwide) carriers, thereby causing "downstream delays" for Tier II and

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[30/] *Id*.

Tier III operators.[31/] Because Tier III (and, to a lesser extent, Tier II) carriers are at the end of the distribution line, they will be the last to receive technical expertise and network equipment from technology vendors.[32/] For this reason, the Commission determined that the three carrier tiers should commence Phase II rollout at different times, with Tier III coming last.[33/] Again, the forbearance requested herein proposes ***no*** additional deferral in deploying Phase II solutions; rather the forbearance sought by TierIIICo will result in a more rational and economic deployment of these solutions.

Section 20.18(h) requires Tier III carriers to provide the accuracy level stated therein on an essentially uniform basis throughout a rural service territory. This expectation is unrealistic because it ignores the demographic variability of rural areas and the design and economic constraints that carriers face in accommodating these non-uniform demand characteristics. Thus, in areas where important traffic arteries converge and where population density is relatively high, carriers typically deploy higher concentrations of cell sites. In these areas, a carrier may well actually achieve or approach achieving Section 20.18(h) locational accuracy.

In more remote portions of a market, and especially where a rural coverage area approaches a cellular or PCS market boundary, the accuracy level achievable from a network-based system will decline. Offsetting this reduced accuracy, however, is the more rapid availability of a network-based

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[31/] *Phase II Stay Order*, ¶ 11. "Based on this record, we conclude that handset vendors and network-based location technology vendors give priority to the larger, nationwide carriers." *Id*., ¶ 11.

[32/] *Id*., ¶ 12.

[33/] *Id*.

deployment. Unlike a potentially more accurate handset-based solution, network-based technology can be immediately utilized by all system users, analog or digital, subscriber or roamer.

Appended hereto as Appendix B is a copy of an *ex parte* filing made by TruePosition, Inc. on July 24, 2000 substantiating the foregoing analysis.[34/] In that filing, TruePosition urged a similar result:

> ...the FCC could encourage more rapid deployment of location systems in rural areas by providing flexible deployment standards that are based upon the carrier's existing choice of cell site locations, cell site antennas, etc. TruePosition believes that in pure 1-to-1 overlay scenarios, where TruePosition receivers are connected only to existing antennas at existing cell sites, system accuracy of 250 meters (67%) in rural environments can be readily achieved. A pure 1-to-1 overlay scenario is generally the least cost and fastest means to a deployment of location services. In order to improve the accuracy in rural areas, more sophisticated and more costly design approaches would be required.[35/]

While, admittedly, the Commission accuracy standards would not be achieved, the voluminous record before the Commission appears to be devoid of any real-world analysis of the impact of a moderate relaxation of the standards in the rural areas on the ability to actually locate a user in a sparse rural environment.

[34/] While this *ex parte* filing is admittedly more than two years old and certain advances in technology have no doubt occurred since that time, the underlying principles remain true. Moreover, despite these assumed increases in achievable accuracy, a 1-to-1 overlay of a network-based solution using the existing antenna systems would remain the least costly alternative until such time as sufficient accuracy can be achieved with deploying *less* than a 1-to-1 overlay. TierIIICo doubts this is the case as it has been unable to find any network-based vendor that will contractually obligate itself to meeting the FCC accuracy requirements throughout a rural licensed service area from a network-based solution deployed at all existing rural cell sites using existing CMRS network antenna systems.

[35/] Letter to Ms. Magalie Roman Salas from Philip L. Verveer and David M. Don, July 24, 2000, at p.3.

TierIIICo specifically requests that the Commission forbear from enforcing its accuracy requirements, for an initial period up to and including December 31, 2005, in the instance where a wireless carrier, in a rural environment, deploys a network-based solution using existing antenna systems at all existing sites that could be used to provide location service to the wireless carrier's licensed service area within a PSAP's area, in timely response to a PSAP request. During this period of time, the wireless carrier would file predicted accuracy maps for such service area, updated as additional cell sites are deployed, quarterly reports of all E911 location activity and, to the extent made available by the PSAP, the distance between the provided location and actual location of the 911 caller as well as time required to locate the 911 caller once the emergency personnel arrived at the location provided by the network-based solution. This information, gathered over the initial period during which this forbearance was in affect, would provide valuable real-world information which the Commission could use to evaluate the real-world need to enforce more stringent location standards in rural environments. Moreover, TierIIICo respectfully submits that following this procedure would actually enhance public safety during this interim period.

From the standpoint of an existing TDMA network provider, the inability to economically deploy a network-based solution which meets the Commission accuracy requirements, leaves no alternative but to utilize a handset-based solution. However, with the large-carrier decision to migrate away from TDMA as a network protocol, TierIIICo has been unable to identify a single handset manufacturer that will provide an ALI-capable TDMA handset. As a result, the network equipment providers are not supporting handset-based solutions for TDMA either. Therefore, the only alternative is for the TDMA carrier to overlay an entirely new digital network that is capable of using a handset based solution. Of course, that assumes that the handset-based solution will meet

the accuracy requirements in the rural setting (see discussion of the concerns relating to handset-based systems at Section III B, *infra*). Perhaps the worst scenario is where the rural carrier spends the multi-million dollars needed to overlay such a system only to find that the ALI handset-compatible system still falls short of satisfying the FCC's accuracy requirements!

However, even where the ALI-compatible network protocol is overlaid, and even if the accuracy requirements were then achievable, the Commission must recognize that there would be absolutely no compatible handsets in the carrier's network at that point in time! Indeed, the Commission's Rules already provide until December of 2005 for the ALI-capable handsets to be near-universally available in carriers' networks. Of course, even if that ubiquity within the home network did occur (an unlikely outcome recognized by the FCC in requiring that analog service continue to be supported by carriers for an additional 5 year period of time), there is absolutely no guaranty that any roamer would have the right type of handset to receive any location service in any market but his or her own.

A further consideration is the delay that will result in implementing an ALI handset-compatible network strictly to meet E911 needs in a rural application. Specifically, unlike urban deployments where the PSAPs have been making coordinated efforts to simultaneously deploy regional E911 Phase II compatible systems, rural PSAPs appear to be operating on far more individual schedules. Where rural markets primarily connect multiple large to mid size urban areas, rural PSAPs (unless they operate independently) are attempting to consolidate their deployments with regional PSAP operations. Unfortunately, individual PSAPs throughout the rural market are aligning with different regional PSAP networks. The net result is still a very sporadic deployment schedule.

Missouri RSA No. 7 Limited Partnership dba Mid-Missouri Cellular ("MMC"), a member of TierIIICo and the B Block cellular licensee in Missouri RSA 7 and a rural portion of the Kansas City Unserved area, is presently contending with the consequences of both regional PSAP consolidation coupled with uncoordinated PSAP rural deployment. MMC's service area includes portions of Ray County, which is part of the Kansas City MSA, even though the County is extremely rural. The Ray County PSAP is being integrated into the consolidated Kansas City metro E911 system. The regional selective router for this rural PSAP is located approximately 70 miles from the area of Ray County served by MMC.

MMC has a *total* subscriber count of approximately 100 customers in Ray County. Nevertheless, the Ray County PSAP has requested E911 Phase II service from MMC. Under current Commission Rules, MMC would be obligated to begin providing such service in September of 2003. The only option currently available to MMC to meet this request requires overlaying a new digital system. Because no other PSAP has triggered a Phase II request anywhere else in the MMC's FCC-licensed service area, the multi-million dollar expense associated with a system-wide overbuild would be incurred solely to meet the Ray County PSAP request. Missouri has ***not*** implemented ***any*** cost-recovery mechanism for wireless E911. Accordingly, incurring a multi-million dollar digital overlay expenditure to support accuracy-compliant E911 Phase II service for 100 Ray County subscriber's would indisputably be "unduly burdensome". Accordingly, MMC has requested that Ray County withdraw its E911 Phase II request until such time as the balance of the PSAPs in MMC's market are ready to support E911 Phase II. A copy of MMC's request is appended hereto

as Appendix C. This letter represents MMC's first step in seeking relief, as outlined in the Commission's King County Order.[36/]

MMC currently provides service to Ray County from two essentially omni-directional cell sites. A third MMC cell site, whose signal is insufficient to afford reliable cellular service in Ray County, can assist in providing triangulation to a portion of Ray County. Deploying a location-based network solution using existing antenna systems at these three existing sites will not achieve Section 20.18 accuracy throughout Ray County. While the cost of deploying a network-based solution at these three cell sites will be substantial, it is a mere fraction of the cost of overlaying an entirely new digital network. A three cell site network-based solution ***could*** be placed in service within the time frame allowed under the present rules, and would provide location service to ***all*** mobiles being served by the MMC system in that area, independent of a handset's ALI capabilities (or lack thereof). No record data suggests that this level of economically achievable location accuracy would fail to result in meaningful improvements in real world public safety in Ray County, relative to the *status quo*. At the same time, MMC's present inability to economically deploy a Section 20.18(h) compliant solution at this time is beyond question. Assuming, *arguendo*, that MMC could deploy such a solution, the total lack of compatible handsets in the possession of the MMC subscribers, conclusively establishes that actual E911 locational service in Ray County would be deferred for a substantial period of time under the current rules. Accordingly, grant of the forbearance sought

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[36/] "Where our rules impose a disproportionate burden on a particular carrier, the carrier may work with the public safety entities involved to mitigate that burden and, if necessary, may seek individual relief from the Commission." *Order on Reconsideration, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Request of King County, Washington,* FCC 02-146, CC Docket No. 94-102, (rel. July 24, 2002), at paragraph 18.

herein would actually speed the availability of E911 service in some of the most rural parts of the country.[37/]

B. HANDSET-BASED PHASE II TECHNOLOGY

The handset-based option presents some of the same technical, operational and practical issues discussed in connection with network-based technology. In addition, handset technology has its own unique set of concerns for Tier III carriers that reflect the particular engineering and manufacturing characteristics associated with ALI-capable handsets.

1. Tier III TDMA Carriers

Particularly unfortunate is the dilemma facing Tier III carriers whose systems operate with the TDMA air interface. Many carriers initially selected this protocol to maintain network compatibility with their principal roaming partners, Cingular Wireless and/or AT&T Wireless. Approximately eighteen (18) months ago, Cingular and AT&T made public their decision to phase out their TDMA networks in favor of alternate digital technologies. Responding to this decision, all major handset manufacturers abandoned efforts to develop TDMA-compatible, ALI-capable handsets.[38/] As a result, TDMA-based Tier III carriers cannot satisfy their Phase II E911 obligation with handset technology, unless they incur the enormous expense of retrofitting their networks with an entirely new digital protocol. Having made the vast cost-commitment and endured the

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[37/] Significantly, the MMC example is offered for illustrative purposes only. Additional members of TierIIICo are in the same situation and will be seeking relief from deployment obligations from the isolated PSAPs that have requested E911 Phase II service and/or the FCC. Denial of the requested forbearance will only result in a flood of piecemeal waiver requests and will not avoid the need for the Commission to consider the merits set forth herein.

[38/] *See* Dobson Cellular Systems, Inc. Petition For Waiver Of Sections 20.18(e), (f0 and (h) Of The Commission's Rules (CC Docket No. 94-102), filed September 4, 2001, pp. 13-14, n. 32.

coordination issues such a retrofit entails, the carrier will still have to deal with the quandary presented by roamers whose handsets are based on incompatible technologies, as explained below.

2. Accommodating Roamers

As a percentage of total call volume, Tier III carriers typically originate and terminate more roamer calls than their Tier I and Tier II counterparts. Thus, business necessity compels Tier III carriers to pay special attention to roamer needs and to accommodate those needs whenever possible. Specifically, consumers who use non-ALI-capable handsets or those designed for air interfaces other than the one selected by the foreign system's carrier, or whose home system has deployed a network-based Phase II solution, could be deprived of Phase II ALI indefinitely in rural markets. This result completely undermines the benefit of ALI-capability for the roaming caller in an emergency situation and impedes achievement of the Commission's public safety policy objective.

To remedy the handset incompatibility problem, the *Third R&O* required that all handset-based Phase II ALI solutions must be "generally interoperable," which was defined as follows:

> This means at a minimum that the solution must conform to general standards that permit the system employed by the carrier to provide 911 ALI for any ALI-capable handset that complies with the general standard, regardless of whether the handset uses the same ALI solution as that employed by the carrier. For example, if SnapTrack, IDC and Lucent all develop and market separate ALI systems, for a particular air interface, handsets using *any* of these solutions must be interoperable with the others, such that a carrier using any one of the solutions can and does provide ALI for calls coming from a handset using any other solutions.[39/]

Having dictated that all handset solutions be interoperable, the Commission nevertheless acknowledged that roamers on otherwise incompatible handset-based systems will experience

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[39/] *Third R&O*, ¶ 60 (emphasis added). The interoperability requirement for handset-based solutions is codified in Section 20.18(g)(4) of the Rules.

diminished accuracy levels and other performance criteria, and that a "carrier's system may not be optimized for other handset solutions."[40/] This recognition, however, did not prompt the Commission to adjust its locational accuracy standards in general or, more pertinently, for markets served by Tier III carriers who are more dependent on roamer-generated calling than their Tier I or II counterparts. Additionally, other variables can also affect the accuracy of a handset-based solution such as the variance in performance characteristics from one handset manufacturer to another. A serving carrier providing access to a roamer within its market would have no control over the handset which that roamer is actually using.

3. Availability of ALI-Capable Handsets

Timely availability of and prompt accessibility to ALI-capable handsets is another challenge facing Tier III carriers. Because the respective subscriber bases they serve are smaller than those of their Tier I and II counterparts, Tier III carriers are unable to generate sufficient handset demand to warrant direct customer relationships with manufacturers.[41/] As a result, Tier III carriers must deal with wholesalers, distributors and other intermediaries who have no specific commitment to accommodating demand in the smallest and most rural markets. This disparity, coupled with the difficulty small, rural carriers have in obtaining price and quantity information, place them at a

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[40/] *Third R&O*, ¶ 61.

[41/] *See Phase II Stay Order*, ¶ 20 ("This approach recognizes that wireless carriers with relatively small customer bases are at a disadvantage as compared with the large nationwide carriers in acquiring location technologies, network components, and handsets needed to comply with our regulations."); see also, *id*. ¶ 10 (" . . . The record demonstrates that non-nationwide CMRS carriers have much less ability than the nationwide CMRS carriers to obtain the specific vendor commitments necessary to deploy E911 immediately . . .").

distinct disadvantage relative to large nationwide and regional carriers in terms of implementing handset-based Phase II technology.

Of three principal wholesale distributors nationwide, only one was even able to respond to an inquiry made on behalf of TierIIICo regarding ALI-capable handset availability. In that response, the wholesaler acknowledged that it could not predict the availability, pricing, or quantity of any ALI-capable handsets for rural Tier III carriers.[42/]

4. Technical Limitations of ALI-Capable Handsets

While the foregoing address concerns over the availability of location service, of even greater concern in the instant context is the fact that there is little empirical evidence as to whether commercially available ALI-capable handsets, even once deployed in a rural environment, can meet the FCC's accuracy requirements. In contrast to urban areas where a significant amount of CMRS traffic is pedestrian, far more rural traffic is generated by vehicular-based portable handsets that lack external antennas.

The position determination capability of ALI-enabled handsets is subject to the technology's innate limitations and constraints. To provide accurate XY coordinate data to the PSAP, these handsets must communicate with GPS satellites. When line-of-site contact with the satellite is impeded or lost, the "911" dialing subscriber's geographic coordinates cannot be conveyed accurately, even with network assistance. For example, if "911" is dialed when the ALI handset is in a building or structure, or when it is in an automobile or other vehicle (assuming no link between the handset and an exterior antenna), the handset's ALI technology could be degraded depending on

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[42/] Declaration of James C. Egyud, Consulting Engineer, dated November 20, 2002, attached hereto as Appendix D (hereinafter referred to a "*Egyud Declaration*").

the amount of structural and morphological attenuation.[43/] Even the Commission has acknowledged that handset technology may fail in tall buildings or in tunnels.[44/]

In practice, once the ALI handset loses contact with the GPS satellite, most handset-based solutions appear to rely on assistance from the network to try and substitute for the lack of available GPS locational information. These "network-assisted" solutions then face the same limitations that network-based solutions do in their ability to consistently and accurately determine the subscriber location, using only existing, wide-spaced rural cell sites.

In light of the foregoing, TierIIICo respectfully requests that the Commission forbear from enforcing the accuracy requirements with respect to carriers that deploy handset-based solutions. To the extent that the handset-based solutions meet the FCC accuracy requirements as some vendors have asserted, grant of the instant forbearance would have absolutely no impact on the locational accuracy achieved by these solutions as the forbearance of enforcing the accuracy requirement would not alter the achievable result. However, it is likely that handset-based solutions will also fall short of attaining the Section 20.18(h) accuracy standards. In that event, substantially more time may be required before an economical Section 20.18(h)-compliant enhancement can be deployed. The limited forbearance sought herein would permit rural carriers that are capable of deploying handset-based solutions on their networks to do so without the fear that, even after such deployment, they may still require individual waivers because of inherent limitations in this technology. To date, widespread rural deployment and handset availability for rural testing has been lacking and accurate "real-world" data collection needs to be obtained.

[43/] *Id.*

[44/] *Third R&O*, ¶¶ 24, 57.

As with the forbearance request associated with the network-based solution, TierIIICo specifically requests that the Commission forbear, for an initial period up to and including December 31, 2005, from enforcing its accuracy requirements in the instance where a wireless carrier, in a rural environment, deploys a handset-based solution, in timely response to a PSAP request.[45/] During this period of time, the wireless carrier deploying a handset-based solution would file quarterly reports of all E911 location activity and, to the extent made available by the PSAP, the distance between the provided location and actual location of the 911 caller, as well as time required to locate the 911 caller once the emergency personnel arrived at the location provided by the handset-based solution. This information, gathered over the period during which this forbearance was in affect, would provide valuable real-world information which the Commission could use to evaluate the accuracy of handset-based solutions in a rural, real world application and provide a basis upon which to determine whether there is a need to enforce more stringent location standards in rural environments. Again, if the handset-based solutions actually prove capable of providing the level of accuracy that has been touted but remains unproven in rural applications, the grant of this forbearance would have absolutely no impact on the availability of E911 Phase II service that meets the accuracy requirements. However, in the event that the technology falls short in a the real-world rural application, the denial of this forbearance request would do nothing to result in a higher level of accuracy being achievable ahead of the schedule needed by the vendors to actually address the rural ALI issues. All the forbearance would do would be to relieve the FCC from a flood of last-minute

[45/] Of course, there may still be the need to further extend the ALI-compatible handset deadlines if the requisite handsets continue to be unavailable in sufficient quantity to enable the rural carriers, forced to buy through distributors, to meet those milestones.

individual rural carrier waiver requests and relieve rural carriers from the prospect of facing ruinous enforcement proceedings over issues wholly beyond their control.

C. TECHNICAL, OPERATIONAL AND PRACTICAL CONCERNS COMMON TO BOTH NETWORK-BASED AND HANDSET-BASED SOLUTIONS

The preceding sections have examined how certain unique attributes of network-based and handset-based solutions make the accuracy and reliability standards set forth in Section 20.18(h) economically unattainable for Tier III carriers within at least the next two year period. The following analysis considers certain technical, operational and practical characteristics common to both network and handset solutions that severely hinder Tier III carriers from attaining Section 20.18(h) accuracy or otherwise demonstrate why strictly enforcing that accuracy standard against Tier III carriers will subvert the Commission's public interest and policy objectives in instituting the Enhanced 911 Emergency Calling Systems docket.

1. Reliability Of Test Data and Test Guidelines

At various junctures in the course of the Enhanced 911 Emergency Calling Systems docket, the Commission has cited favorably to pre-deployment testing of network-based and handset-based solutions and the accuracy levels achieved thereby.[46/] Moreover, the Commission cites these test results to substantiate its E911 Phase II policy decisions, including accuracy standards, and to assert that carriers will be able to satisfy Section 20.18(h) accuracy and reliability with available technology. [47/] TierIIICo respectfully submits, however, that the referenced test data is subject to

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[46/] *See e.g. Fourth MO&O*, ¶¶ 18 - 20 (and tests cited therein).

[47/] *Id.* at ¶ 23.

serious limitations and that the Commission's unquestioning reliance on that data may have been inappropriate considering the context in which the tests were performed.

Conceptual issues raised by the Commission's reliance on pre-deployment testing were concisely outlined in the *Hatfield Report*:

> Clearly, the performance in the latter, "real world" environment can only approach the inherent performance characteristics of the technology in a more idealized environment. For example, in an actual operating network , the *distances between base stations may be greater* or their geometry may be far from ideal. Or a particular portion of a network may suffer from greater intra-system interference than in a more idealized, pre-deployment test bed. These "real world" conditions can prevent a terrestrial, network based solution form delivering the accuracy of which it is inherently capable. Similarly, the presence of dense foliage or "urban canyons" may prevent a satellite-based (i.e., GPS) system from achieving its full performance.[48/]

These inherent limitations in the testing that contributed to the Commission's decision-making in adopting Section 20.18(h) are hardly academic or speculative. Indeed, the differences between the "idealized environment" in which pre-deployment tests were performed and the real world conditions faced by Tier III carriers are especially significant. One critical example of this disparity involves the technical and economic challenges posed in Tier III markets by their relatively low number of potential subscribers and meager population densities. These immutable demographic facts compel Tier III carriers to maximize cell separation wherever possible--- the polar opposite of the idealized spacing employed by vendors when conducting pre-deployment testing.

[48/] *Hatfield Report*, p. 35 (emphasis added).

In an *ex parte* filing, Grayson Communications, a prominent location technology vendor, presented test results for network-based systems it installed in Illinois and Indiana. TierIIICo's analysis of the filing revealed the same concerns and disparities noted in the *Hatfield Report*. Thus, the test map submitted in Grayson's *ex parte* indicates unambiguously that all test measurements were collected from *within* the perimeter of the transmitting facilities that Grayson equipped with its network-based Phase II solution hardware; no measurements were presented from outside or beyond the perimeter or cluster.[49/] In stark contrast to this idealized compiling of test results, Tier III carriers operate systems where coverage is provided in areas extending several miles beyond the outer perimeter of the carrier's cell or transmitting sites. The Grayson test results provide no data indicating whether Section 20.18(h) accuracy can be achieved for 911 calls in these areas. RF engineering principles, however, suggest the mandatory accuracy cannot be achieved because these calls will occur in areas with less overlapping coverage than calls made from within the perimeter of equipped transmitting sites.[50/] Another notable feature of the Grayson tests is that the maximum spacing between equipped sites within the test area was roughly ten (10) miles, considerably less than the 15 - 20 mile spacing encountered between facilities in a typical Tier III service area. Locational accuracy in the latter scenario will be less than in the former.[51/]

[49/] *Egyud Declaration*.

[50/] *Id*. Moreover, if a PSAP boundary extends entirely beyond a carrier's actual coverage area, a 911 call will be impossible in this non-overlapped area, unless the carrier installs additional cell sites for the sole purpose of extending its E911 coverage— a substantial capital expense that will generate no offsetting revenue.

[51/] *Id*.

The *Hatfield Report*'s analysis of the Commission's guidelines for determining whether position location systems comply with Section 20.18(h) provides another example of how strict adherence to this exacting standard may actually *diminish* safety of life and property, in direct contravention of the Commission's paramount policy objective in the Enhanced 911 Emergency Calling Systems docket. [52/] First, *Hatfield* correctly notes that, while *OET-71* establishes basic guidelines for determining whether operating systems comply with Section 20.18(h) accuracy requirements, it is not "a complete test specification and that, as a result, there is significant room for interpretation and, therefore, disagreement."[53/] Thus, there is presently no Commission-approved protocol that carriers can use to verify to the Commission's satisfaction that the Phase II solutions they deployed comply with Section 20.18(h).

This lack of a definitive set of guidelines and protocols for testing the accuracy of deployed systems leads to a very unsettling implication, also discussed in the *Hatfield Report*. The accuracy of the position determination corresponding to an individual E911 call will increase with the number of measurements taken and the processing time allowed. For this reason, a Phase II system incapable of meeting Section 20.18(h) standards initially could ultimately attain compliance by delaying "either the initial delivery of the call itself or subsequent delivery of the position information (*i.e.*, the XY

[52/] The Commission's guidelines are set forth in OET Bulletin No. 71, Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems, Federal Communications Commission, April 12, 2000 ("*OET -71*").

[53/] *Hatfield Report*, p. 35. Indeed, the introduction to *OET-71* (p. 2) plainly admits that the document intends only to provide guidance and "be helpful" to groups and organizations that seek to develop standard test conditions and protocols.

coordinates)."[54/] Delay in delivering the call itself may cause the "911" caller to abandon the call completely, or to abandon and retry. Delay in delivering the corresponding position information may cause the call to be misdirected or "timed-out' by a switching machine.

By trying to achieve compliance with the exacting accuracy requirement of Section 20.18(h), the carrier may inadvertently cause a "911" call to be abandoned, misdirected or "timed-out," precluding or delaying the caller's access to emergency service. As a result, by committing itself to an accuracy standard that appears unrealistically high in rural applications, the Commission may subvert that public safety objective whose promotion and enhancement impelled the Commission to require wireless carriers to develop and deploy Phase II E911 solutions.

2. Cross-Technology Roaming

The Commission has acknowledged that wireless subscribers whose home systems have deployed network-based Phase II E911 technology will generally be deprived of this capability when roaming in networks utilizing a handset-based solution.[55/] Several solutions, which the Commission collectively refers to as a "best practice" approach, are suggested to handset-based callers[56/]. First, "where only Phase I accuracy is reasonably available," the carrier should provide it to all 911

[54/] *Id.*

[55/] *Third R&O*, ¶ 55.

[56/] The "best practice" approach is codified in the Commission's Rules at Section 20.18(g)(3), which states:

> For all 911 calls from portable or mobile phones that do not contain the hardware and/or software needed to enable the licensee to provide Phase II enhanced 911 service, the licensee shall, after a PSAP request is received, support, in the area served by the PSAP, Phase I location for 911 calls or other available best practice method of providing the location of the portable or mobile phone to the PSAP.

carriers. The Commission has also referred favorably to a possible software upgrade for CDMA systems to provide ALI with accuracy approximating 285 meters, which it describes as "somewhat more accurate" than Phase I location accuracy.[57/] Finally, the Commission has suggested that handset-based carriers should use the infrastructure of a co-located wireless carrier that has deployed a network-based solution "as a backup, in order to provide Phase II ALI to its callers whenever its own ALI solution cannot."

Several aspects of the "best practice" approach are instructive with respect to the issues raised in this petition. First, only the Phase I option, which the Commission admits provides a "rough level of accuracy," is expressly mentioned in Section 20.18(g)(3). TierIIICo has no information concerning availability or cost of the CDMA upgrade option, which offers only a marginal improvement in accuracy over the Phase I. Whether this upgrade even exists is unknown. Finally, the back-up suggestion assumes both the existence of a co-located wireless system that has deployed network-based technology and reasonable technical means for transferring a "911" call from one network to another. In any event, all of these "suggestions" are meaningless if the strict accuracy requirements of Section 20.18(h) remain in effect.

IV. THE COMMISSION SHOULD FORBEAR FROM ENFORCING SECTION 20.18(h) OF ITS RULES AGAINST TIER III CARRIERS

Although not a waiver request, TierIIICo's instant proposal complies with prior Commission directives that petitions seeking waiver relief from Section 20.18 must be "specific, focused and

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[57/] *Id.* ¶ 56.

limited in scope, and [show] a clear path to full compliance."[58/] The instant petition, though seeking agency forbearance under Section 10 of the Act, complies with requirements that the Commission has imposed on rule waiver petitions even though the latter impose a more difficult burden and higher legal hurdle on the petitioner.

The instant petition also satisfies the standards imposed by the Act for petitions of this type. Thus, TierIIICo demonstrates below that strict application of Section 20.18(h) to Tier III carriers is unnecessary to ensure that the charges, practices, and classifications of TierIIICo's participating carriers are just, reasonable and non-discriminatory. Moreover, strict enforcement of Section 20.18(h) against Tier III carriers is unnecessary to protect consumers, and forbearing from that enforcement will encourage competition in the relevant service markets. For this reason, forbearance is decidedly in the public interest and should be granted here.

It is worth restating the principle, recognized by the Commission, that accuracy is only one gauge of wireless E911's contribution to public safety. Other equally important variables include reliability, cost and extent of deployment. If strict enforcement of Section 20.18(h)'s accuracy standards against Tier III carriers were to reduce the reliability and extent of deployment, while substantially inflating costs, the ramifications for public safety in small, rural service areas will be adverse. Enforcing Section 20.18(h) against Tier III carriers is, however, likely to have this perverse outcome because of the considerable technical, operational, practical, economic and strategic concerns that implementing Phase II technology, both network and handset-based, in the physical environment served by Tier III carriers presents.

[58/] *Fourth MO&O*, at ¶44.

A. THE FORBEARANCE SOUGHT HERE IS SPECIFIC, FOCUSED AND LIMITED IN SCOPE

The forbearance relief sought here is unambiguously specific, focused and limited in scope. Notably, TierIIICo is *not* seeking forbearance from the obligation to select, order, install and optimize Phase II solutions within six months of a PSAP request or on September 1, 2003, whichever occurs later. Nor is TierIIICo requesting relief from the population or territorial coverage requirements associated with initiating those solutions. TierIIICo accepts and will abide by those obligations.

By granting this petition, the Commission will authorize rural carriers to install network and handset-based Phase II solutions within the coverage area of their respective networks from transmitting facilities as they presently exist. By so doing, the Commission signifies that it will accept and deem compliant the resulting accuracy levels— even if they fall outside the margins established by Section 20.18(h), for an interim period of time during which the underlying premise of the need for a higher level of accuracy in a rural environment can be tested and evaluated. Thus, the proposed forbearance is narrowly tailored and limited in scope to reflect the technical, operational, and practical obstacles, discussed earlier, that make attaining Section 20.18(h) accuracy unfeasible in Tier III markets.

Because the forbearance requested here is for a fixed period, the path to full compliance is straightforward. During the forbearance period, TierIIICo will work with its equipment vendors and other experts to overcome the many difficult issues that continue to vex Phase II technology solutions in the smallest, rural markets served by Tier III carriers. As these matters are resolved, accuracy and reliability of the TierIIICo Phase II systems will improve. At the same time, the

TierIIICo request offers the opportunity for the Commission to determine what real-world location accuracy level is truly required in rural applications to meet the public safety need. TierIIICo submits that pinpointing a 911 caller to within 500 meters in a rural application might well result in the authorities being able to actually find the caller (the only purpose behind E911 Phase II rules at all) in far less time than knowing the caller's location to within 150 meters in the center of a large urban area having, for example, four (4), fifty-story office buildings lying within that location parameter. As with many regulations, "one size fits all"is likely to prove to be incorrect in this application. Accordingly, requiring rural carriers to spend far greater sums of money in an effort to immediately achieve a level of accuracy that might prove both unnecessary and unattainable is clearly not in the public interest.

B. THIS REQUEST SATISFIES ALL SECTION 10 REQUIREMENTS

As discussed, Section 10 of the Act compels the Commission to forbear from applying any regulation to a telecommunications carrier (or service) upon finding that enforcement of the regulation is unnecessary either to ensure that the carrier's rates, practices, classifications, *etc*. are just, reasonable and non-discriminatory, or to protect consumers.[59/] In addition, the Commission must determine that forbearance is consistent with the public interest and, in so doing, must "consider" whether forbearance will promote competitive market conditions (including encouragement of competition among telecommunications providers).[60/] The limited forbearance

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[59/] 47 U.S.C. § 160(a)(1) and (2).

[60/] 47 U.S.C. § 160(a)(3) and (b). Even if a petitioner fails to show that forbearance enhances competition among carriers, 47 U.S.C. § 160(b) does not bar the Commission from granting forbearance. The Commission has held that the public interest factor in § 160(a)(3) is a broad standard that should be exercised in a manner consistent with the Act's other goals. *See* Bell (continued...)

requested here with respect to subjecting Tier III carriers to Section 20.18(h) more than complies with these statutory constraints. Indeed, TierIIICo will demonstrate below that forbearing from Section 20.18(h) as specified herein will actually prevent Tier III carriers' charges from *becoming* unjust, unreasonable and discriminatory due to attempted compliance with the demanding accuracy levels that rule section imposes.

1. Forbearance Will Allow Tier III Carriers To Maintain Rates, Practices and Classifications That Are Just, Reasonable and Non-Discriminatory

For Tier III carriers selecting network-based Phase II technology, strict compliance with the Section 20.18(h) quantitative accuracy criteria necessitates construction of new base stations at the perimeter of a carrier's licensed service areas and in other situations where "ribbon of pearls" or other minimally overlapping cellular configurations are presently deployed. This new infrastructure, which is in addition to the Phase II network elements that must be installed at each existing cell (costing tens of thousands of dollars per cell ***not including*** the cost of the site itself, the recurring back-haul, and capital improvements, such as the tower, required at the 911-only site), will generate little or no incremental revenue. Indeed, the need to place these cell sites beyond the edge of the rural carrier's licensed service area in order to effectively "triangulate back" into the rural carrier's licensed service area virtually ensures that these multiple sites, ringing the carrier's licensed service area but located beyond the carrier's licensed service area, can ***never*** be used for the carrier to actually provide CMRS service. The capital expenditure and operating costs associated with this

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[60/](...continued)
Operating Companies Petition for Forbearance from the Application of Section 272 of the Communications Act of 1934, As Amended, to Certain Activities, CC Docket No. 96-149, 13 FCC Rcd 2627 (1998) (rejecting AT&T's suggestion that forbearance must enhance competition).

infrastructure will have to be recovered entirely from a Tier III carrier's comparatively meager complement of existing local subscribers. As a result, strict enforcement of Section 20.18(h) against Tier III carriers will inevitably cause substantial rate increases for rural consumers, residential and business alike, which, in turn, may cause these users to terminate or curtail mobile wireless service.[61/]

Tier III carriers opting for a handset solution are hardly better off with respect to the inordinate costs and inevitable rate increases that strict Section 20.18(h) portends. TDMA-based Tier III carriers, for example, can deploy handset technology only if they first retrofit their networks with a new digital protocol. The staggering capital expenditure associated with this migration—which is incremental to, rather than in place of, the cost associated with replacing the existing stock of deployed handsets— will again be recovered from a limited pool of rural residential and business subscribers. Moreover, even where a carrier presently deploys a digital network technology for which ALI-capable handsets are available, deploying network enhancements, if needed, to increase the accuracy to the level required by the rules can substantially increase costs for that deployment as well.

Strict enforcement of Section 20.18(h) is hardly necessary to ensure that Tier III carriers' rates are just, reasonable and non-discriminatory. As shown above, however, such enforcement is likely to precipitate enormous, but otherwise superfluous capital expenditures by Tier III carriers;

[61/] In this regard, the Commission must be intensely sensitive to the law of unintended consequences. It is well known, for example, that automotive catalytic converters, which were reasonably intended to reduce air pollution, inflated new car prices to the extent that their mandatory imposition led to a secular decrease in the frequency with which owners replaced their vehicles; as a result, older, more polluting cars remained in use for longer periods, subverting the air quality improvement that converters were supposed to accomplish. If strict enforcement of Section 20.18(h) causes subscribers in Tier III markets to discontinue (or substitute a less expensive, non-911 capable) service, government regulation, admittedly well-intentioned, will have the ironic effect of diminishing rather than enhancing the safety of life and property.

the inevitable rate hikes these expenditures necessitate may, ironically, cause the unjust and unreasonable rates that Section 10(a)(1) was designed to preclude.[62/] With the long standing goal of expanding telecommunications services into the "high-cost" rural areas without pricing those services out of reach of the rural user, imposing an urban accuracy standard on a rural carrier that actually results in a dramatically increased cost of service to the rural customer is contrary to this universal goal. Thus, the limited forbearance requested here indisputably meets the first enumerated requirement of the forbearance statute.

2. Forbearance Is Consistent With and May Enhance Consumer Protection

The statute also requires the Commission to determine that enforcing Section 20.18(h) is "not necessary for the protection of consumers." The Commission has already recognized that an accuracy standard that is eminently reasonable for urban areas may be unrealistically stringent in small, rural markets. In those markets, the Commission concluded that a 300 meter accuracy benchmark will offer "a *very useful* indication of location . . ."[63/]

This view comports with simple common sense. In wide-open, sparsely populated Tier III markets, which lack dense housing developments, multi-story apartment and office structures, and underground facilities (*e.g.* parking), a flexible accuracy standard of 300 (or more) meters is unlikely to have any adverse impact on successful position determination. In this respect, strict adherence to Section 20.18(h) accuracy is unnecessary to protect consumers in Tier III markets and

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[62/] An alternative, but no more desirable outcome is the necessity for rate adjustments that make the Tier III carrier's service noncompetitive. In this regard, at least Tier II and Tier III carriers have the distinct advantage of being able to subsidize their high-cost rural E911 compliance with their urban and suburban subscriber bases.

[63/] *Third R&O* (¶ 72) (emphasis added).

the two-year, limited forbearance urged here implies no detriment to consumer interests. Strict enforcement, by contrast, may induce Tier III carriers to make imprudent and wasteful capital expenditures, whose recovery from local subscribers could pressure them to terminate or curtail their mobile wireless service. Such an outcome will make consumers less safe and diminish protection of their lives and property.[64/] Moreover, as discussed above, where compliance with the Phase II obligations is unduly burdensome on particular carriers, the Commission has left the door open for the carriers to seek relief from those obligations. Grant of the forbearance sought herein would allow rural carriers to proceed with an economical deployment of Phase II technology in a timely manner.

3. Forbearance Will Enable Tier III Carriers to Serve Their Markets While Rolling Out Phase II E911 Solutions

While aware of and concerned by their obligations to implement E911 Phase II, Tier III carriers have other major undertakings on their near-term agendas. Financial survival in an environment where Tier I and Tier II rivals are increasingly building facilities to serve the most desirable highways and other traffic generators is a critical priority. In addition to E911, Tier III carriers must strive to comply with other unfunded federal mandates like CALEA, number pooling and local number portability, all of which have their own substantial capital expenditure requirements and many of which also hit rural carriers disproportionately.

At the same time, Tier III carriers, as well as their larger counterparts, must devote scarce resources to the quotidian task of reinforcing coverage and expanding footprints to attract new subscribers while retaining existing ones. TierIIICo respectfully submits that competition among rival carriers will be better fueled by allowing Tier III carriers to direct their very limited resources

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[64/] *See Phase II Stay Order*, ¶ 4 ("For many Americans, the ability to call for help in an emergency is the principal reason they own a wireless phone.")

to continued network development and deployment in tandem with the Phase II rollout. Absent forbearance, however, TierIIICo's members will be forced to concentrate their capital spending almost exclusively on the infrastructure and elements required to achieve Section 20.18(h) compliance rather than the balanced approach necessitated by present market realities.

The Commission must also consider that while Tier I and Tier II carriers are overbuilding the major traffic arteries and larger population centers in the rural markets, Tier III carriers remain focused on bringing wireless service to the most remote and least-served areas where the return on investment is much longer. If a rural carrier is providing service to a marginal area, deploying E911 Phase II service to that area that provides location accuracy to within the present accuracy level mandated for the community with a total population of 1000 on the same level as for an urban area with a multi-million person population, might well make it uneconomical for the rural carrier to continue providing service to that area. A rural carrier can also obviate its Phase II accuracy obligations by simply terminating its CMRS service in that rural PSAP's coverage area or not expanding service into those more-remote areas in the first place. TierIIICo respectfully submits that the public interest is far better served by a reduced level of accuracy for Phase II location services in these rural areas than to inflexibly insist on strict compliance and thereby ensure that all calls, including emergency 911 calls, go uncompleted because there is no carrier providing service there.

The limited two-year forbearance proposed here will greatly facilitate Tier III carriers' ability to make all the capital expenditures necessary for providing high quality and reliable service to their customer bases and may well provide the Commission with sufficient real-world documentation to demonstrate that a lower rural accuracy standard does not compromise the public safety. Strict enforcement of Section 20.18(h) accuracy, on the other hand, will undermine that ability and will

impel carriers into exorbitant and imprudent capital expenditures for the sole purpose of attempting to satisfy the accuracy benchmarks which, even after such expenditures, might not be economically achievable in a rural application with today's technology. Accordingly, limited forbearance, as proposed here, will strengthen the ability of Tier III carriers to compete in the marketplace; strict enforcement will undercut that ability. Forbearance will, therefore, promote competitive market conditions and, as a result, forbearance satisfies the public interest requirement set forth in Section 10(a)(3) of the Act.

V. CONCLUSION

For the reasons provided herein, the Commission should forbear from enforcing the accuracy standards in Section 20.18(h) of the Rules up to and including December 31, 2005.

Respectfully submitted,

THE TIER III COALITION FOR WIRELESS E911

By */S/ Michael K. Kurtis*
Michael K. Kurtis
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November 20, 2002

APPENDIX A

The Tier III Coalition for Wireless E911

List of Constituent Carriers

The Tier III Coalition for Wireless E911

Constituent Carriers

Cal-One Cellular L.P.

California RSA #3 Limited Partnership, A California Limited Partnership d/b/a Golden State Cellular

El Dorado Cellular, A California Corporation d/b/a Mountain Cellular

Illinois Valley Cellular RSA 2-I Partnership d/b/a Illinois Valley Cellular

Illinois Valley Cellular RSA 2-II Partnership d/b/a Illinois Valley Cellular

Illinois Valley Cellular RSA 2-III Partnership d/b/a Illinois Valley Cellular

Iowa RSA No. 2 Limited Partnership d/b/a Lyrix Wireless

Minnesota Southern Cellular Telephone Company d/b/a HickoryTech Wireless

Missouri RSA No. 7 Limited Partnership d/b/a Mid-Missouri Cellular

Northwest Missouri Cellular Limited Partnership

Public Service Cellular, Inc.

RSA 1 Limited Partnership d/b/a Cellular 29 Plus

APPENDIX B

Ex Parte Filing Made By TruePosition, Inc.

Dated July 24, 2000

EX PARTE OR LATE FILED

WILLKIE FARR & GALLAGHER

EX PARTE

Three Lafayette Centre
1155 21st Street, NW
Washington, DC 20036-3384

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VIA HAND DELIVERY

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JUL 24 2000

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

July 24, 2000

ORIGINAL

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
12th Street Lobby, TW-A325
Washington, DC 20554

Re: Ex Parte Presentation in CC Docket No. 94-102.

Dear Ms. Salas:

We are writing on behalf of TruePosition, Inc. to provide further information about TruePosition's ability to provide wireless location services in rural areas and the testing methodology TruePosition employs to measure the accuracy of its network-based location technology. This information should prove useful in light of recent discussions we have had with the staff of the Wireless Telecommunications Bureau concerning TruePosition's field trials and other testing of its technology.

Since late 1996, TruePosition has deployed its receivers in over 300 cell sites in a variety of environments including dense urban, suburban, rural, and over water. To date, these systems have been implemented for AMPS, TDMA, and CDMA networks in the cellular (850 MHz) band. TruePosition believes that its system is capable of meeting the current FCC mandate of 100 meters for 67 percent of wireless 911 calls for each of these air interfaces and for each of these environments. However, for each carrier's network, satisfying the Commission's location requirements will come at different costs. Reasons for these differences include, among other things, the transmission bandwidth,[1] the transmission length of the control channel,[2] and the

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[1] AMPS and TDMA transmissions have a transmission bandwidth of less than 30 KHz, while CDMA has a transmission bandwidth of 1.22 MHz. TruePosition's ability to detect and resolve multipath errors is partially a function of transmission bandwidth.

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transmitted power of the control and voice channels[3] -- each of which varies depending upon the air interface the carrier has selected.

It is apparent that rural areas present unique challenges to providing wireless location-based services. Wireless networks are typically constructed using cell sites separated by 1000 to 3000 feet in urban areas, 3 to 10 miles in suburban areas, and 10 to 30 miles in rural areas. While attenuation due to propagation is greater in urban areas and much less in rural areas, there are frequently many fewer cell sites available for location processing in rural areas than urban areas. In addition, cell sites in rural areas are frequently in a linear "string-of-pearls" geometry. Thus, it is highly unlikely that network-based technologies in rural areas can satisfy the Commission's existing accuracy requirements for wireless E911 unless carriers are required to undertake very substantial expenditures for this purpose. At this time, however, TruePosition is confident that it can deploy its location technologies today in rural areas without requiring unreasonable expenditures by carriers and that the accuracy of this location technology will advance the Commission's goals in this proceeding.

By extrapolating the data from field tests and laboratory testing of its location technologies, TruePosition has determined that its technologies can meet a 250 meter accuracy standard in rural areas without requiring carriers to expend significantly more resources to construct additional facilities. This calculation is applicable to all existing CMRS transmission standards. While this 250 meter calculation does not satisfy the Commission's existing requirement, we believe that it would prove sufficient to bring substantial benefits to wireless subscribers living and traveling in rural areas.

When designing a location network for a rural area, TruePosition and the wireless carrier must consider the following choices: (1) whether the design can be accomplished using only the carrier's existing cell sites; (2) whether the design can be accomplished using only the carrier's existing antennas deployed at the existing cell sites; (3) whether the design can be accomplished

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2 The transmission length of an AMPS control channel is approximately 100 ms, a TDMA control channel is approximately 13.4 to 21.2 ms, and a CDMA control channel is approximately 160 ms. Transmission lengths can be up to several seconds for the purpose of integration for location processing. Location accuracy is enhanced by longer transmission times.

3 The transmitted power for AMPS and TDMA control channels is typically 100 to 600 mW, and voice channel power is typically 6 to 600 mW. CDMA control and voice channel power is typically <1 microWatts to 6 mW. Over the last 2 years, the transmitted power has been gradually reduced in order to increase capacity. TruePosition's ability to locate accurately and to detect and resolve multipath errors is partially a function of transmitted power.

using TDOA-only or whether a combination of TDOA/AOA must be deployed (the use of AOA to meet a design criteria requires use of specialized antennas not typically utilized for communications); (4) whether the design can be accomplished using transmission length and transmission power settings that the carrier has chosen for quality communications.

Each of these design choices will have an impact on the cost of the system design. As previously presented, TruePosition believes that its system can meet the current FCC accuracy criteria in all cases, however, the design implications of the FCC criteria in rural areas can require carrier expenditures on additional cell sites, additional antennas, increased use of AOA, or changes in the transmission power/length settings. Given the large investment in capital deployments by the wireless industry recently, wireless carriers have been reluctant to make substantial new investments, especially in rural areas where the greatest modifications may be required to comply with the 100 meter, 67 percent criteria.

On the other hand, the FCC could encourage more rapid deployment of location systems in rural areas by providing flexible deployment standards that are based upon the carrier's existing choices of cell site locations, cell site antennas, etc. TruePosition believes that in pure 1-to-1 overlay scenarios, where TruePosition receivers are connected only to existing antennas at existing cell sites, system accuracy of 250 meters (67%) in rural environments can be readily achieved. A pure 1-to-1 overlay scenario is generally the least cost and fastest means to a deployment of location services. In order to improve the accuracy in rural areas, more sophisticated and more costly design approaches would be required.

In the future, the natural development of CMRS networks will lead to improvements in location accuracy. For example, the number of cell sites nationwide continues to grow dramatically. This increases cell site density which directly affects location processing. Moreover, rural cell sites are gradually being converted from omnidirectional antennas to sectored antennas. This increases the gain of the antennas in rural areas and can increase the number of cell sites available for location processing. The evolution of wireless phones to support 3G standards will increase the transmission bandwidth and will also have a very positive impact on location accuracy. Finally, commercial location services, which are non-existent today, are forecast to grow rapidly. The Commission can expect investment will follow market opportunity and there will be increased willingness over time to implement more sophisticated designs.

In addition, TruePosition would like to further explain its methodology for field testing its location technologies. Pursuant to the terms of OET Bulletin No. 71, TruePosition has adopted a testing methodology that is based on actual E911 call location information and is weighted to those areas where more calls are made.[4] As described in previous filings, TruePosition's testing methodology is designed to mimic wireless 911 call scenarios. Therefore, TruePosition uses

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[4] Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems, OET Bulletin No. 71 (rel. March 31, 2000).

standard handheld and mobile wireless phones which have not been modified in any manner (neither hardware nor software modifications). These phones are then used to place test calls in both in-vehicle and walking scenarios, and the calls are placed in sufficient quantities and from a sufficiently large number of places to assure a reasonable statistical sample. In determining the cross section of places from which to place test calls, TruePosition uses the existing distribution of wireless 911 calls as a guide.

Generally, TruePosition and the wireless carrier with whom it is testing will agree upon the number of test points to be used as well as the coverage area of the test points. The test points are typically laid out in a grid pattern, with the actual pattern varying depending upon the terrain, roads and highways, and cell site density. Test points may be as close of 1/10 of a mile in dense areas and as far as 2 miles apart in rural areas. Cell site density is a good proxy for subscriber and call density, therefore test point density will increase with cell site density. The wireless 911 call patterns can be easily determined from the TruePosition system itself as well as by anecdotal evidence from local PSAPs. (Even prior to optimization, the TruePosition system is sufficiently accurate to capture all 911 calls and approximately locate them. Simple plotting on electronic maps rapidly reveals 911 calls patterns.)

After density and spacing have been determined, the test points are then distributed according to logical test routes that can be repeatedly driven over a period of a few weeks. For example, a driver will be given a map for which a particular route has been highlighted. On the route, specific points are explicitly identified (i.e. the fire hydrant at the S.E. corner of 5th and Main Streets, or mile marker 38.2 westbound on I-80). The same test points are used for each drive test, and ground truth is predetermined using differential GPS for each test point. Each test point is given a dialing code so that each call can be associated with a test point. Using this method, a drive tester will stop at each test point in sequence, and may dial *1001 at the first test point, *1002 at the second test point, *1003 at the third test point, and so on. A reasonable statistical sample is created by placing 10 to 20 calls at each test point. The TruePosition system will locate each call, resulting in a latitude/longitude determination that is later compared to the stored ground truth for the test point associated with the dialed digits.

TruePosition uses a database program that then combines all of the test calls, the accuracy associated with each test call, and a weighting that corresponds to existing wireless 911 call patterns. Statistics can be computed for each test point or for the entire system. Data can be separately reported for analog calls and digital calls. In a 100 cell site system covering a typical average market, we would adopt 100 to 200 test points, and conduct 1000 to 3000 test calls per day for several days.

We hope you find this information useful in your deliberations. If you have any questions, please do not hesitate to contact us.

Respectfully submitted,

Philip L. Verveer
David M. Don

cc: Bob Eckert
Pat Forster
Dan Grosh
Bill Lane
Marty Liebman
Ron Netro
Jim Schlichting
Blaise Scinto
Tom Stanley
Tom Sugrue

APPENDIX C

Missouri RSA No. 7 Limited Partnership d/b/a Mid-Missouri Cellular
Letter Requesting Withdrawal of Ray County E911 Phase II Request
Dated October 14, 2002

KURTIS & ASSOCIATES, P.C.

SUITE 200
1000 POTOMAC STREET, N.W.
WASHINGTON, D.C. 20007

(202) 328-4500
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October 14, 2002

Via Facsimile and First Class US Mail

Ms. Saralyn Doty
Mid-America Regional Council
600 Broadway, Suite 300
Kansas City, Missouri 64105-1554

Re: Mid-Missouri Cellular E911 Phase II Request

Dear Ms. Doty:

This firm serves as special counsel to Missouri RSA No. 7 Limited Partnership dba Mid-Missouri Cellular ("MMC") with respect to matters before the Federal Communications Commission ("FCC"). In that capacity, I participated in a conference call last week with Mr. Greg Ballentine and you from the Mid-America Regional Council ("MARC") and Ms. Kathie Zentgraf of MMC regarding your October 8, 2002 request for MMC to provide E911 Phase I and Phase II service in Ray County, Missouri.

From those discussions, we understand that MARC is a regional council that is providing consolidated coordination for E911 services for the greater Kansas City metropolitan area. Ray County is a part of that area. Indeed, with the exception of MMC, we believe that all other commercial mobile radio service ("CMRS") providers that are licensed to provide service in Ray County, are also licensed to provide service throughout the greater Kansas City metropolitan area.

In sharp contrast, MMC operates a rural-only network and is not licensed to provide CMRS to any other part of the greater Kansas City metropolitan area. Specifically, the MMC network operates exclusively in Lafayette, Saline, Howard, Cooper, Pettis, Johnson and Ray Counties in Missouri.[1] MMC has a subscriber base of approximately 100 customers in Ray County.

[1] It should be noted that MMC is also licensed to serve a small portion of Cass County, Missouri. However, that geographic area actually receives CMRS as a part of the Cingular Wireless network, under contract between MMC and Cingular. Accordingly, E911 calls in that area are handled by the Cingular network and not the MMC network.

The MMC network presently operates using a TDMA digital protocol. That technology was deployed in order to maintain compatibility with MMC's then-major roaming partner, Cingular Wireless (fka Southwestern Bell Wireless). Cingular and AT&T were, by far, the two largest carriers utilizing the TDMA protocol.

Approximately 18 months ago, both Cingular and AT&T announced that they would be migrating away from the TDMA protocol. As a result, all major network and handset equipment vendors announced a discontinuation of development of new features and hardware for that protocol. Unfortunately, that included the plans to develop an automatic location identifier ("ALI") handset based on the TDMA protocol. Accordingly, the only means with which a TDMA network can provide E911 Phase II service is through a network-based technology.

Network-based location systems pin-point the subscriber by using received signals from multiple antenna sites in order to triangulate on the physical position of the subscriber. The accuracy of these networks increases as the number of antennas per cell site and the number of cell sites providing service to a given area increase. The MMC Ray County facilities are presently limited to two omni-directional cell sites. Indeed, the entire MMC network is comprised exclusively of omni-directional cell sites with minimal overlap in coverage; sufficient to provide CMRS service but not sufficient to allow triangulation of a mobile position using a network-based E911 solution. Accordingly, MMC has yet to be able to find an E911 network-based solution vendor that will commit to meeting the FCC's accuracy requirements in this type of rural environment. Accordingly, the only E911 Phase II technology currently available to meet the FCC accuracy requirements appears to be a handset-based solution. With the unavailability of TDMA handsets, the use of a handset-based solution will require the replacement of the entire MMC digital network with a new digital protocol for which ALI handsets will be available.

MMC has been actively pursing this alternative. Unfortunately, the cost to migrate the MMC network would be approximately $3 million. Significantly, as of this point in time, Ray County is the ***only*** PSAP request which MMC has received for E911 Phase II service. However, because of the large expenditures needed to migrate the MMC switching center in order to be able to host the alternate digital technology, the cost to migrate only the two Ray County cell sites would still approach $2 million. MMC would therefore be facing a capital expenditure of nearly $20,000 ***per Ray County subscriber*** to implement the alternative digital technology in Ray County only. Moreover, since this functionality is embedded in the handset, Ray County subscribers would need to be provided with handsets which were incompatible with the rest of the MMC network in order to utilize the E911 Phase II location capabilities of the system within Ray County.

MMC is categorized as a Tier III carrier by the FCC.[2] As such, it is obligated to provide E911 Phase II service to 50% of its coverage area within the PSAP's service area by September 1, 2003 and 100% of the PSAP's service area by September 1, 2004. However, there is no obligation on the part of the carrier to replace existing non-ALI capable handsets with new handsets. Rather, the carrier's obligation is only to begin selling ALI-capable handsets by September 1 2003, and to ensure that all new handset sales are ALI-capable by November 30, 2004. Tier III carriers have until December 31, 2005 in which to ensure 95% penetration of its subscriber base with ALI-capable handsets.

In light of the foregoing, MMC respectfully submits that there would be little practical benefit realized from seeking to require MMC to implement Phase II capabilities in Ray County at this time. Accordingly, MMC requests that MARC withdraw its request that MMC proceed at this time to be E911 Phase II compliant, in favor of allowing MMC to work with MARC as well as the other PSAPs serving the remaining counties in the MMC coverage area, to enable MMC to delay the deployment of E911 Phase II capabilities until the PSAPs serving the balance of the MMC counties are ready to also support that service. While the cost of implementing E911 Phase II will still be substantial, at that point in time MMC will at least be able to spread those costs across its entire subscriber base and ensure that the entire MMC network remains compatible from a digital protocol standpoint. Moreover, MMC understands that next generation network-based solutions are presently in development which promise to increase the accuracy achievable in a rural environment. If that level of accuracy proves able to satisfy FCC requirements, then MMC would be able to provide E911 Phase II service from a network-based platform that would be not only significantly less expensive to deploy, but would have the advantage of making this important service immediately available to all subscribers and roamers, and not just those who replace their handsets.

Since the MMC network is not a part of a the greater Kansas City metropolitan area that the MARC E911 network is designed to serve, and since MMC serves such a small subscriber base in only one of the counties involved in the MARC network, we respectfully request that MARC fully consider the impact of its request on MMC in light of the reality that handset deployment rules will, in fact, make the date by which meaningful E911 Phase II service would be available, much further into the future than the date which the current MARC request would trigger for the network to be made E911 Phase II capable.

The second part of your letter deals with the decision to place the MARC selective router in Lenexa, Kansas, a southwestern suburb of Kansas City (Ray County is far northeast of Kansas City). While this location no doubt makes economic sense for MARC and is, most likely, economically neutral to the Kansas City based CMRS carriers included in the MARC E911 area, as a rural-only carrier based in Sedalia, Missouri, asking MMC to install and maintain facilities to that selective router location is extremely burdensome for MMC. Significantly, ***all*** MMC E911 calls to the MARC

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[2] *Order to Stay*, in CC Docket No. 94-102 (Rel. July 26, 2002) at paragraph 23.

network will be destined for the Ray County PSAP. Accordingly, the purpose behind sending the calls to the selective router to determine the appropriate PSAP to which to route the call, is unnecessary in this circumstance and requiring MMC to do so would place a substantial burden on MMC.

In order to quantify the impact on MMC, MMC has obtained price quotes for dedicated T1 facilities to route from the MMC network to both the Lenexa, KS selective router and the Ray County PSAP. The recurring monthly price quoted by Southwestern Bell Telephone for the circuit to Lenexa is $1,727.00 as compared to a monthly recurring cost of $365.00 for a dedicated T1 to the Ray County PSAP. The ***difference*** between these circuit costs on an annual basis is $16,344.

In light of the foregoing, MMC requests that it be allowed to route its E911 traffic directly to the PSAP location. Since all of the traffic sent to the selective router by MMC would be destined for the Ray County PSAP anyway, this would appear to be a reasonable request. If, however, there was some internal reason that MARC wanted the calls to be routed to the Lenexa, KS selective router, we would ask that MMC still be allowed to deliver the calls to the Ray County PSAP. At that location, the MMC inbound traffic could be added to the dedicated T1 which we understand will be maintained between that PSAP location and the Lenexa router site. From our discussions, we understand that, from a capacity standpoint, that dedicated facility will be very lightly utilized. Since this issue relates to both E911 Phase I and Phase II calls, it will need to be addressed even if MARC were to withdraw its request for E911 Phase II service from MMC at this time.

The FCC is well aware of the economic impact on small rural carriers in meeting E911 obligations. While the FCC has generally imposed obligations, such as meeting the PSAP at the selective router, the FCC has recognized that application of its general rules can impose significant burdens on individual carriers. Accordingly the FCC has stated that

> Where our rules impose a disproportionate burden on a particular carrier, the carrier may work with the public safety entities involved to mitigate that burden and, if necessary, may seek individual relief from the Commission. [3]

By this letter, MMC is hoping to work with MARC to mitigate the burdens imposed by its October 8, 2002 letter in advance of seeking formal relief from the FCC.

As a final matter, any obligation on the CMRS carrier is wholly contingent on the relevant PSAP being able to actually receive and process the E911 Phase I and/or Phase II information. We

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[3] *Order on Reconsideration, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Request of King County, Washington,* FCC 02-146, CC Docket No. 94-102, (Rel. July 24, 2002), at paragraph 18.

ask that you provide us with written confirmation of the ability of the Ray County PSAP to receive and process the E911 Phase I and Phase II information at this time.

If you have any questions or require additional information with respect to this matter, please do not hesitate to call.

Very truly yours,

/S/ *Michael K. Kurtis*

Michael K. Kurtis

cc: Ms. Kathie Zentgraf

APPENDIX D

Declaration of James C. Egyud

Dated November 20, 2002

Engineering Declaration of James C. Egyud

During the past several years, vendors of network-based E911 Phase 2 ALI technology have issued documentation, both in advertising form and in FCC filings, claiming the ability of the vendors' solutions to meet the FCC's accuracy requirements for E911 Phase 2. I have reviewed much of that documentation and, in many cases, those materials include broad claims of compliance without specificity regarding the environment or the requirements placed upon the carrier's cell site placement and configuration necessary to achieve such compliance. Some materials claim compliance in "rural" environments, but do not clarify that such compliance is entirely dependent upon the distance between cell sites, their geometry, their proliferation, and the amount of uplink coverage attainable with each site. I do not dispute the vendors' representations that their solutions have the capability to perform location measurements meeting the FCC's accuracy requirements. However, the ability to achieve that accuracy level is wholly dependent upon idealized antenna placement, terrain, environmental conditions, geometry, and spacing between antenna sites that permits them to do so. Vendors have not specified the maximum inter-site distances over which such accuracy is achievable, and the environments used to conduct the tests for which I have seen data have not been representative of the typical "real world" network deployment.

Simply stated, the network-based solutions use Time Difference of Arrival (TDOA) as a core algorithm to determine the position of a handset via triangulation. TDOA, by its very nature, requires the signal from a handset to reach not less than three (3) distinct cell sites. Clearly, the ability of a signal to reach each equipped site is dependent upon all factors normally associated with cellular coverage, such as distance, intervening terrain and morphology (buildings and foliage), antenna height, coverage pattern, etc. Therefore, the ability of TDOA to perform accurate measurements is entirely dependent upon a handset's location with respect to nearby cell sites, and the proximity of those cell sites to each other. Greater spacing between cell sites, such as in a rural setting, understandably reduces the overlap of coverage among those sites. Regardless of the receiver sensitivity of the TDOA equipment, which the vendors have not stated with specificity, the TDOA "link budget" will eventually be exhausted. Moreover, the placement of rural sites along a highway in a "string-of-pearls" arrangement, with enough distance, essentially precludes more than 2 sites from overlapping with each other. If the mobile is near one site, it might not have sufficient overlap from either adjacent site. Complicating matters further, the uplink power reduction algorithms inherent to digital technologies such as TDMA and CDMA cause a reduction in the handset's signal as it approaches a site, further deteriorating the ability of a second, more distant site to receive sufficient signal from the handset.

Clearly, if the site spacing in a rural setting results in minimal overlap, due to the carrier's coverage needs, additional TDOA-only antenna sites would be required to meet the FCC's requirements in areas where overlap is insufficient. In the case of a single-site "island", two additional antenna sites would be required.

As an alternative, where three antenna sites are unable to triangulate, the vendors offer Angle-of-Arrival (AOA) technology, where the carrier must place dedicated, specialized antennas at two (2) neighboring sites. The AOA antennas use multiple correlated elements that measure the phase of the arriving signal from the handset, and compare the phases to calculate position, according to the vendors. I have been advised verbally by these vendors that such antennas measure 3' x 4' in size, for an equivalent wind-loading "flat plate" area of approximately 12 square feet. By contrast, typical cellular and PCS antennas offer two (2) feet or less wind-loading area. Moreover, I have been advised that the AOA antennas require no less than four (4) feed lines each, whereas a standard cellular or PCS antenna requires one. Therefore, most rural cellular towers, which were designed to support only a given number of antennas and lines for coverage purposes, will not be able to support the AOA antennas, whose wind loading, combined with the loading of the feed lines, will be more than six (6) times that of a typical cellular antenna. Deployment of such antennas for the sole purpose of E911 accuracy would require substantial expenditures to reinforce towers (if possible), zoning approval for such antennas (which can take two years or more in some jurisdictions), and the possible need to replace towers entirely. Such actions would serve to generate no revenue for the carrier. Moreover, like TDOA, AOA accuracy across two sites remains entirely dependent on the spacing and morphology between those sites. This also fails to take into account that many rural cell sites are not sectorized but, instead, utilize near omni-directional antennas. The AOA antennas are directional, and I understand that two or possibly three of these panels would be required at each cell site. In those cases, the loading for the AOA antennas as compared to the omni-directional cellular coverage antennas is far greater than the six-fold increase specified above.

From my review, the materials presented by the vendors have not appeared to demonstrate the maximum path loss between sites where sufficient overlap remains to meet the FCC's requirements. Path loss is a function of the impeding factors discussed above: distance, antenna configuration, terrain and foliage attenuation, and cell geometry. More specifically, I have seen no test results applicable to most "real world" rural markets, with cell sites often separated by 15 to 30 miles or more and extensive areas served by sites in a string-of-pearls arrangement along a highway or by a single facility as an "island". Supporting test results, applicable to those "real-world" deployments, have not been presented. I have made repeated requests to Grayson and TruePosition, the most prevalent network-based technology vendors, for test data applicable to such scenarios. The vendors have not provided such data. Instead, they have directed me to the types of materials discussed above. Analysis of that documentation further supports the conclusion that there is no evidence to support a representation that any of the network-based solutions can satisfy the FCC accuracy requirements throughout a rural market, even if the network-based solution is deployed at every existing cell site in the typical rural system.

By way of example, on September 20, 2002, Grayson directed me to *ex parte* presentations that it filed with the Commission, with the most recent test data filed on October 25, 2001, and again on November 21, 2001. In this filing, Grayson presented data collected from its tests of the systems that it installed in St. Clair County, IL and

Lake County, IN. Grayson asserts in its October 25, 2001 letter that "the system tests demonstrated Phase II-compliant accuracy in suburban, rural and highway environments."[1] I do not refute the results presented by Grayson, nor do I refute Grayson's claims regarding the ability of its solution to meet the Phase 2 accuracy requirements using the sites that it equipped for the tests. In fact, the test presentation did not contain enough engineering support (e.g., site antenna specifications, ground elevations, terrain profiles, RF coverage maps, test methodology, etc.) to permit an engineer to either scientifically support or refute those conclusory results. However, for the reasons set forth below, the test scenarios are simply not indicative of the typical "real world" rural deployment, which involves far greater site spacing, less favorable geometry, and "string-of-pearls" highway configurations where no more than two cells typically overlap with each other; conditions not included in the Grayson testbed.

The test map submitted by Grayson shows a cluster of sites at which it deployed its TDOA equipment. The map also identifies points at which test measurements were taken. The most cursory review of the map reveals that all test points were collected from *within* the perimeter of facilities equipped with TDOA. In other words, no measurements were presented from outside this perimeter or cluster. Although the presentation did not contain supporting RF parameters (e.g., antenna heights, antenna models, orientations, etc.), it is reasonable to expect a test location within the perimeter of equipped sites to have a better chance of having overlapping coverage from multiple sites than a test location outside that perimeter. In reality, a typical rural carrier operates a system where all of its sites are contained within a group of counties whose jurisdictional boundaries usually extend several miles beyond the outer perimeter of a carrier's cell sites. The available test results do not clearly demonstrate whether or not 911 calls in such areas (i.e, outside the perimeter of equipped sites) will receive the FCC required accuracy levels. We can only surmise from general cellular coverage knowledge and sound engineering practice that such calls have far less of a chance of receiving the required accuracy because they will occur in areas with less overlapping coverage than calls made inside the cluster of equipped facilities. In order for the Grayson report to support its ultimate conclusion, it would require that the entire rural cellular service area be located within a perimeter of cell site locations. That, in turn, would require the deployment of cell sites constructed beyond the market boundary and wholly encircling the rural licensed area; a situation never encountered in the rural "real world."

Second, the greatest spacing between equipped sites within the test area is approximately ten (10) miles, much less than the 15 to 30 miles often encountered between facilities in a typical rural service area. Clearly, the overlap between facilities spaced 20 miles apart will be less than the overlap between facilities ten miles apart, and triangulation accuracy can be expected to decrease accordingly. Regardless of TDOA receiver sensitivity, path losses will eventually exceed the margin allotted by that equipment. In summary, the Grayson *ex parte* test data merely asserts accuracy for a cluster of equipped sites with a

[1] Notice of *Ex Parte* Meeting, CC Docket No. 94-102, filed on behalf of Grayson Wireless Division by Eliot J. Greenwald.

given geometry and density that permit such accuracy and does not support the stated conclusion that the Grayson system will meet the FCC accuracy requirements in a "real world" rural environment. All the Grayson submission actually demonstrates is that under idealized conditions, which are not representative of a "real world" full rural market deployment, the Grayson system ***can*** meet the FCC accuracy requirements. Even the site spacing in many rural environments far exceeds the spacing used in these tests. Accordingly, it is important that the Grayson report not be assumed to demonstrate that the accuracy requirements can be met within a perimeter of actually deployed rural cell sites under any conditions having less favorable cell spacing, geometry, antenna configurations, and morphology than the idealized test bed.

In an article in the March, 2002 issue of *GPS World*, Mario Proietti of TechnoCom Corporation, a technologically neutral testing and integration firm, delivers a similar assessment of environmental and network design effects upon TDOA and AOA accuracy. In the article, Mr. Proietti raises concerns that issues such as multi-path interference, site density, and unfavorable geometry, particularly along rural highways, will degrade network-based performance.[2]

Grayson's *ex parte* filing and the aforementioned GPS World article merely support the theory that TDOA and AOA accuracy is potentially achievable, but is entirely dependent upon favorable site density and geometry, which may not be available in many rural cases. Therefore, meeting the Commission's accuracy requirements over a PSAP's entire area in the "real world" rural environment will involve building additional antenna sites that otherwise would not be needed, either between existing facilities or outside of the existing coverage area, and possibly outside of the carrier's market. Such sites would serve the sole purpose of meeting the FCC's E911 accuracy requirements while providing no revenue for the carrier. Mr. Dale Hatfield specifically recognizes this problem in his report to the Commission filed on October 15, 2002.[3] This also raises the issue of a carrier possibly being required to provide coverage, for the sole purpose of E911 accuracy, in an area that is actually served by a neighboring carrier.

In its July 24, 2000 *ex parte* presentation to the Commission, TruePosition offered a nearly identical assessment of the rural carrier's plight in reaching the mandated accuracy levels:

> ". . . there are frequently many fewer cell sites available for location processing in rural areas than urban areas. In addition, cell sites in rural areas are frequently in a linear "string-of-pearls" geometry. Thus, it is highly unlikely that network-based technologies in rural areas can satisfy the Commission's existing accuracy

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[2] *GPS World*, March 2002, E911 Roundtable, Carrier Choices in Location: The System Integrator's View, by Mario Proietti, TechnoCom Corporation.

[3] *A Report on Technical and Operational Issues Impacting The Provision of Wireless Enhanced 911 Services*, by Dale N. Hatfield, p.12. WT Docket No. 02-46.

requirements for wireless E911 unless carriers are required to undertake very substantial expenditures for this purpose."[4]

In addition to network-based technology, potential handset-based technology solutions have been developed in the industry for E911 Phase 2. The CDMA variant uses the Global Positioning System ("GPS"), combined with network assistance in the form of reference GPS measurements (Assisted GPS or "AGPS") and Advanced Forward Link Trilateration ("AFLT"), which leverages synchronized timing data inherent to all CDMA calls. AGPS/AFLT developers such as SnapTrack and QUALCOMM have offered promising theoretical support and prototypical test results pointing towards potential compliance with the Commission's accuracy requirements in many calling scenarios. However, I have yet to receive scientifically justified test results using actual consumer handsets with the integrated AGPS/AFLT solution. As a point of concern, it is well known that in-building and in-vehicle attenuation severely impede a traditional GPS receiver from receiving adequate satellite signal to perform an accurate positional determination. While the AGPS/AFLT developers assert that AGPS, by virtue of GPS reference assistance from the network, achieves an improved sensitivity over stand-alone units, the technology is not entirely immune to degradation from significant attenuation of dense morphological circumstances. Examples of such circumstances might be a heavy structure or the inside of a vehicle, compounded by steep adjoining terrain, dense foliage, and heavy cloud cover.

In areas where satellite acquisition is not sufficient, AFLT adds timing measurements that reach the handset from the CDMA base stations in the natural call process. This, of course, assumes that the handset receives sufficient signal strength from enough cell sites to be of assistance in the triangulation process. As discussed earlier, rural cell geometry and spacing will often limit the number of sites having contact with the handset, thereby reducing network AFLT assistance. According to verbal and written information provided to me, absent sufficient satellite acquisition, AFLT by itself will not yield the accuracy mandated by the Commission.[5] In his *GPS World* article, Mr. Proietti raises significant concerns that "Upgrades to the handsets are needed to achieve the location accuracy specified by E911 requirements." Mr. Proietti also alludes to expensive costs of handset-based technology deployment.[6]

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[4] *Ex Parte* Presentation of TruePosition, Inc. in CC Docket No. 94-102, filed on July 24, 2000, at 2.

[5] *GpsOne™ hybrid position location system*, paper by Samir Soliman, Parag Agashe, Ivan Fernandez, Alkinoos Vayanos, Peter Gaal, and Milan Oljaca; QUALCOMM, Incorporated. (field trial results, p. 6)

[6] See *Proietti.*

Compounding the lack of test reports for commercial-grade handsets, Tier III rural carriers have yet to obtain ALI-capable handsets that they can independently test for accuracy, let alone offer to their subscribers. Over the past 15 months, I have made numerous verbal and written requests to the prominent handset wholesalers, from whom the Tier III carriers must purchase handsets because those carriers lack the market clout to be able to test and purchase handsets directly from the manufacturers. Of the three most prominent distributors, only one responded to my inquiries with knowledge of any ALI-capable handsets. Even in that case, the distributor could not predict when ALI-capable models will become commercially available to Tier III carriers, let alone at what price or in what quantity. Once such handsets do become available in commercial quantities, a Tier III carrier should not be expected to promote that such handsets meet the FCC's accuracy requirements without independently verified results of tests conducted by the carrier or by another party, or a guarantee by the manufacturer.

As the Commission is well aware, TDMA carriers do not have a handset-based option for E911 Phase 2. Therefore, the other alternative for a TDMA carrier to cover the entire area would be to perform a network-wide protocol change to CDMA or GSM, which would permit a handset-based solution, at a cost of millions of dollars. Aside from the cost of this entire system overlay, as stated above, significant questions remain as to whether the new overlaid system, using a handset-based technology, will even be able to meet the Phase II accuracy requirements in a "real world" rural environment. Even if the accuracy could be achieved, the handset-based solution would serve *only* those subscribers with the properly equipped handsets and not serve any other subscribers or roamers not so equipped.

It is apparent from the ongoing development of TDOA and AOA technology that E911 Phase II accuracy possible from network-based solutions may continue to improve. Both TruePosition and Grayson have indicated ongoing solution development in their public materials. Moreover, in the evolution of their networks, rural carriers will also continue to add facilities over the coming years as required by revenue-generating market demand. Such additional sites, as discussed above, will also serve to improve upon coverage and accuracy obtainable from the network-based solutions. TruePosition's *ex parte* filing offers this same prediction of a growth path to higher achievable accuracy in the future as a natural outcome.[7]

In summary, forbearance from the accuracy requirements will permit the carriers in the rural areas to provide E911 service to the greatest portion of the public at the most economical cost. It will also permit the FCC to develop the well-defined, standardized compliance tests that Mr. Hatfield recommended in his report.[8]

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7 *TruePosition* at 3.

8 *Hatfield Report* at 35.

AFFIDAVIT

I, James C. Egyud, hereby declare and state as follows:

1. I am a Senior Consulting Engineer in the field of wireless telecommunications with the firm of Kurtis & Associates, P.C.;

2. I graduated from Grove City College, Grove City, Pennsylvania, with a degree of Bachelor of Science in Electrical Engineering in 1990;

3. I am familiar with the Federal Communications Commission's Rules and Regulations, including Part 22 and Section 20.18 regarding the provision of Enhanced 911 services;

4. I have designed cellular and PCS systems throughout the United States since 1990, and am familiar with the technical, operational, and propagation characteristics associated therewith;

5. I am familiar with the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102;

6. I am familiar with the report submitted to the FCC by Mr. Dale Hatfield on October 15, 2002, regarding "Technical and Operational Wireless E911 Issues", WT Docket No. 02-46;

7. I am familiar with the technical options available to CMRS carriers for the provision of Enhanced 911 services, and the current technological limitations inherent to those options;

8. Based on my professional judgment and the experience referenced herein, I am technically qualified and responsible for the attached Declaration regarding the provision of Enhanced 911 services by "Tier III" CMRS carriers in rural areas;

9. The foregoing statements are true and correct of my own knowledge except such statements therein made on information and belief, and as to such statements, I believe them to be true;

I declare under penalty of perjury that the foregoing is true and correct.

11/20/02
Date

/S/ James C. Egyud
James C. Egyud

CERTIFICATE OF SERVICE

I, Ruth E. Garavalia, a secretary with the law firm of Kurtis & Associates, P.C., do hereby certify that I have this 20th day of November, 2002, had copies of the foregoing "PETITION PURSUANT TO 47 U.S.C. §160(c) FOR FORBEARANCE FROM E911 ACCURACY STANDARDS IMPOSED ON TIER III CARRIERS FOR LOCATING WIRELESS SUBSCRIBERS UNDER RULE SECTION 20.18(h)" hand delivered to the following:

Chairman Michael K. Powell
Federal Communications Commission
445 - 12th Street, S.W., Room 8-B201
Washington, D.C. 20554

Commissioner Kathleen Q. Abernathy
Federal Communications Commission
445 - 12th Street, S.W., Room 8-B115
Washington, D.C. 20554

Commissioner Kevin J. Martin
Federal Communications Commission
445 - 12th Street, S.W., Room 8-A204
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Commissioner Michael J. Copps
Federal Communications Commission
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Commissioner Jonathan Adelstein
Federal Communications Commission
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Mr. Bryan Tramont
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/S/ *Ruth E. Garavalia*
Ruth E. Garavalia